

Dave,

Since the language of claim 1 is "consisting of" I searched for the 7 elements listed on the search request form, and allowed for no other elements.

I obtained a registry number for MnO₂- inclusions and tried to text search it as well. (L5)

John

=> d his

FILE 'HCA' ENTERED AT 15:22:08 ON 14 MAR 2003
E 20020127131/PN
E US20020127131/PN

L1 1 S E3
SEL L1 RN

→ authors record.

FILE 'REGISTRY' ENTERED AT 15:22:34 ON 14 MAR 2003

L2 10 S E1-E10
L3 8 S L2 NOT (7440-37-1/RN OR 7727-37-9/RN)
L4 7 S L3 NOT 440626-42-6/RN
L5 1 S L2 AND 157353-93-0/RN

FILE 'HCA' ENTERED AT 15:24:43 ON 14 MAR 2003

L6 9 S L4
L7 8 S L5
L8 8 S L6 AND L7

FILE 'REGISTRY' ENTERED AT 15:31:48 ON 14 MAR 2003

L9 6 S L4 NOT L5

FILE 'HCA' ENTERED AT 15:31:58 ON 14 MAR 2003

L10 2 S L9

FILE 'REGISTRY' ENTERED AT 15:46:50 ON 14 MAR 2003

L11 28677 S FE 50-90/MAC AND CR 15-20/MAC AND SI .1-1/MAC

L12 52290 S CU 1-5/MAC

L13 31251 S NI 5-9/MAC

L14 265153 S 0-5 MN/MAC

L15 3929 S L11 AND L12

L16 1408 S L15 AND L13

L17 1250 S L16 AND L14 ← # hits w/ Fe, Cr, Si, Cu, Ni, Mn.

L18 132744 S C 0-.5/MAC

L19 550 S L17 AND L18

L20 71236 S C 0-.1/MAC

L21 535 S L17 AND L20 ← Carbon-range w/ carbon (all 7 elements)

L22 31 S L21 AND 5-7/NC

L23 30 S L22 NOT L9

number Components - maximum = 7

FILE 'LREGISTRY' ENTERED AT 15:54:06 ON 14 MAR 2003

L24 1 S CARBON/CN

FILE 'HCA' ENTERED AT 15:55:39 ON 14 MAR 2003

L25 39 S L22 total of 39 records w/ this alloy composition

L26 1 S L25 AND L5
L27 1373 S L19
L28 8 S L5
L29 2 S L28 AND L13

FILE 'REGISTRY' ENTERED AT 15:59:46 ON 14 MAR 2003
L30 1 S L24

FILE 'HCA' ENTERED AT 15:59:52 ON 14 MAR 2003
L31 243135 S L30
L32 3564889 S L31 OR C OR CARBON
L33 798 S L17 AND L32
L34 68217 S AUSTENIT?
L35 314 S L33 AND L34
L36 515531 S SIO2 OR AL2O3
L37 7 S L35 AND L36
L38 22 S L33 AND L36
L39 31 S L25 AND L34
L40 3 S L39 AND L36

FILE 'REGISTRY' ENTERED AT 16:15:00 ON 14 MAR 2003
L41 15 S (AL/ELS(P)MN/ELS(P)O/ELS(P)SI/ELS) (L) 4/ELC.SUB

FILE 'HCA' ENTERED AT 16:17:25 ON 14 MAR 2003
L42 42 S L41
L43 0 S L17 AND L42
L44 545 S MNO(2N)SIO2(N)AL2O3
L45 3 S L17 AND L44
L46 16 S L13 AND L44
L47 3 S L15 AND L44
L48 1 S L39 AND L44
L49 45 S L44(2N) (INCLUS OR OCCLUS? OR MATERIAL? OR MIXTURE? OR COMPOUN
L50 1 S L13 AND L49
L51 15 S L37 OR L22 NOT (L39 OR L40)
L52 13 S L46 NOT (L37 OR L22 OR L39 OR L40)

=> d L40 1-3 cbib abs hitind hitrn

L40 ANSWER 1 OF 3 HCA COPYRIGHT 2003 ACS

137:81873 **Austenitic** stainless steel with controlled oxide inclusions for decreased crack sensitivity during sheet press forming. Katsuki, Junichi; Iida, Teruyoshi; Yamauchi, Takashi; Suzuki, Satoshi; Hiramatsu, Naoto (Nissin Steel Co., Ltd., Japan). Eur. Pat. Appl. EP 1221494 A1 20020710, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2001-127493 20011128. PRIORITY: JP 2001-1192 20010109.

AB The **austenitic** stainless steel contains C .1toreq.0.4, Si 0.1-1.0, Mn .1toreq.5.0, Cr 15-20, Ni 5-9, Cu 1.0-5.0, N .1toreq.0.035, S .1toreq.0.006, and Al .1toreq.0.003%. The stainless steel microstructure contains dispersed MnO-SiO₂-Al₂O₃ inclusions with .gtoreq.15% SiO₂ and .1toreq.40% Al₂O₃, avoiding the presence of MnO-Cr₂O₃ inclusions. The molten stainless steel in refining is covered with a basic slag, and is strongly deoxidized in vacuum or non-oxidizing atm. with ferrosilicon alloy contg. .1toreq.1.0% Al. The **austenitic** stainless steel is suitable for thin (0.3 mm) sheets that can be press formed without cracks. The typical stainless steel contains C 0.034, Si 0.42, Mn 1.95, Cr 18.35, Ni 6.01, Cu 3.94, N 0.009, S

0.0036, and Al 0.002%.

IC ICM C22C038-42
ICS C22C038-58; C21C007-06

CC 55-3 (Ferrous Metals and Alloys)

ST austenitic stainless steel deoxidn sheet formability

IT Slags
(basic, stainless steel melt covered with; austenitic stainless steel with controlled oxide inclusions for decreased crack sensitivity of sheets in press forming)

IT 440626-42-6
RL: TEM (Technical or engineered material use); USES (Uses)
(alloying of; austenitic stainless steel with controlled oxide inclusions for decreased crack sensitivity of sheets in press forming)

IT 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(atm., stainless steel melt refined under; austenitic stainless steel with controlled oxide inclusions for decreased crack sensitivity of sheets in press forming)

IT 157353-93-0, Aluminum manganese silicon oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(inclusions; austenitic stainless steel with controlled oxide inclusions for decreased crack sensitivity of sheets in press forming)

IT 198487-27-3 198487-29-5 440626-43-7 **440626-44-8**
440626-45-9 440626-46-0
RL: TEM (Technical or engineered material use); USES (Uses)
(microalloyed; austenitic stainless steel with controlled oxide inclusions for decreased crack sensitivity of sheets in press forming)

IT **440626-44-8**
RL: TEM (Technical or engineered material use); USES (Uses)
(microalloyed; austenitic stainless steel with controlled oxide inclusions for decreased crack sensitivity of sheets in press forming)

L40 ANSWER 2 OF 3 HCA COPYRIGHT 2003 ACS

135:229893 Austenitic stainless steel with good surface appearance.

Ishimaru, Eiichiro; Fukumoto, Shigeo; Kobayashi, Hideaki; Okimori, Mayumi (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001247945 A2 20010914, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-58694 20000303.

AB The stainless steel has Al content 0.005-0.05% and Mg content 0.0005-0.005% and contains (a) high-m.p. oxides having **Al₂O₃** phase content .gt;req.25% and/or (b) MgO-**Al₂O₃** spinel phase. The scum-derived surface defect on a cast slab of the steel is prevented.

IC ICM C22C038-44
ICS B22D011-00; B22D011-06; B22D011-108; C22C038-00

CC 55-3 (Ferrous Metals and Alloys)

ST austenitic stainless steel microalloying aluminum magnesium; alumina phase austenitic stainless steel; spinel phase austenitic stainless steel

IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(Al- and Mg-microalloyed austenitic stainless steel contg. alumina and/or spinel for good surface appearance)

IT 11107-04-3, SUS316 11109-50-5, SUS304 11134-23-9, SUS316L
39467-88-4 54938-23-7, SUSXM7

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(Al- and Mg-microalloyed austenitic stainless steel contg.

alumina and/or spinel for good surface appearance)
IT 1344-28-1P, Alumina, preparation
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(high-temp. oxide phase component; Al- and Mg-microalloyed
austenitic stainless steel contg. alumina and/or spinel for
good surface appearance)
IT 12068-51-8P, Aluminum magnesium oxide (Al₂MgO₄)
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(spinel phase component; Al- and Mg-microalloyed **austenitic**
stainless steel contg. alumina and/or spinel for good surface
appearance)
IT **39467-88-4**
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(Al- and Mg-microalloyed **austenitic** stainless steel contg.
alumina and/or spinel for good surface appearance)

L40 ANSWER 3 OF 3 HCA COPYRIGHT 2003 ACS
134:342967 **Austenitic** stainless steel with good surface properties
and hot processibility. Ishimaru, Eiichiro; Fukumoto, Shigeo; Tanaka,
Tomoaki; Kobayashi, Hideaki; Kimura, Ken (Nippon Steel Corp., Japan).
Jpn. Kokai Tokkyo Koho JP 2001140036 A2 20010522, 6 pp. (Japanese).
CODEN: JKXXAF. APPLICATION: JP 1999-328378 19991118.
AB The steel contains Al 0.002-0.05, N 0.01-0.1, Ti 0.005-0.1, Mg
0.0005-0.01% with Ti x N x 10,000 .gtoreq.5 and Ti/Al .gtoreq.3. The
steel contains .gtoreq.1 from Ti nitride, Mg oxide, and MgO-**Al₂O₃**
spinel phase. The steel has good surface properties and hot
processibility.
IC ICM C22C038-00
ICS C22C001-10; C22C038-28; C22C038-50
CC 55-3 (Ferrous Metals and Alloys)
ST **austenitic** stainless steel titanium nitride magnesium oxide
spinel
IT 1302-67-6, Spinel 1309-48-4, Magnesium oxide, uses 25583-20-4,
Titanium nitride
RL: MOA (Modifier or additive use); USES (Uses)
(**austenitic** stainless steel with good surface properties and
hot processibility)
IT 11107-04-3, Sus316 11109-50-5, Sus304 11134-23-9, Sus316L
39467-88-4, YuS27A 54938-23-7, Susxm7
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(**austenitic** stainless steel with good surface properties and
hot processibility)
IT **39467-88-4**, YuS27A
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(**austenitic** stainless steel with good surface properties and
hot processibility)

=> d L31 1-31 cbib abs hitind hitrn

L31 ANSWER 1 OF 243135 HCA COPYRIGHT 2003 ACS
138:179966 Calibration of a sensor for the determination of alcohol in a
humidifying solution for offset printing. Hesekamp, Dietger (Technotrans
AG, Germany). Ger. Offen. DE 10136130 A1 20030220, 4 pp. (German).
CODEN: GWXXBX. APPLICATION: DE 2001-10136130 20010727.
AB Alc. in a humidifying soln. for offset printing is detd. by evapg. water
and alc. contained in the soln. and registration of the concn. using a gas

sensor. The sensor is calibrated by passing a stream of purified air contg. either no alc. or a known amt. of alc. through the app. The air is purified using a dust filter and a filter contg. activated carbon. The sensor chamber is sepd. from the measuring chamber by a membrane.

- IC ICM G01N033-00
 ICS B41F007-32; B41F033-00
 CC 80-6 (Organic Analytical Chemistry)
 Section cross-reference(s): 74
 IT 7440-44-0, Carbon, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (adsorbent; calibration of sensor for detn. of alc. in humidifying soln. for offset printing)
 IT 7440-44-0, Carbon, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (adsorbent; calibration of sensor for detn. of alc. in humidifying soln. for offset printing)

L31 ANSWER 2 OF 243135 HCA COPYRIGHT 2003 ACS

138:179888 Electrochemical sensor. Davis, Brian K.; Scheffler, Towner B.; Busby, Louis J., Jr.; Neighoff, John F., Jr. (Mine Safety Appliances Company, USA). PCT Int. Appl. WO 2003016893 A2 20030227, 35 pp.
 DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2.
 APPLICATION: WO 2002-US24557 20020802. PRIORITY: US 2001-PV311909 20010813; US 2002-164539 20020606.

- AB An electrode for use in an electrochem. sensor includes a catalyst dispersed within an electrolyte. Preferably, the catalyst is immobilized within a matrix of the electrolyte. In one embodiment, the electrode of the present invention includes at least one catalyst/electrolyte layer having a mixt. of a powd. catalyst, a powd., quasi-solid electrolyte and a binder material compressed together. The quasi-solid electrolyte can include a liq. electrolyte immobilized by a high-surface-area, high-pore-vol. solid.
 IC ICM G01N027-00
 CC 79-2 (Inorganic Analytical Chemistry)
 IT 7439-88-5, Iridium, analysis 7440-06-4, Platinum, analysis 7440-22-4, Silver, analysis 7440-44-0, Carbon, analysis 7440-57-5, Gold, analysis
 RL: ARU (Analytical role, unclassified); CAT (Catalyst use); DEV (Device component use); ANST (Analytical study); USES (Uses)
 (design of improved response time hydrogen sulfide electrochem. gas sensor with catalyst immobilized within electrolyte matrix)
 IT 7440-44-0, Carbon, analysis
 RL: ARU (Analytical role, unclassified); CAT (Catalyst use); DEV (Device component use); ANST (Analytical study); USES (Uses)
 (design of improved response time hydrogen sulfide electrochem. gas sensor with catalyst immobilized within electrolyte matrix)

L31 ANSWER 3 OF 243135 HCA COPYRIGHT 2003 ACS

138:179880 Element-trace analysis in purest copper. Kipphardt, Heinrich; Kuxenko, Sandra; Matschat, Ralf (Bundesanstalt fuer Materialforschung und-pruefung (BAM), Berlin, 12489, Germany). GIT Labor-Fachzeitschrift, 46(6), 718-720 (German) 2002. CODEN: GLFAF5. Publisher: GIT Verlag GmbH & Co. KG.

AB A method with a high metrol. level is being developed to characterize purest metals with respect to contamination with other elements for their use as primary calibration stds. This should allow the reliable traceability of chem. measurements in SI units at the national level. This procedure is described using Cu as an example.

CC 79-6 (Inorganic Analytical Chemistry)

IT 7439-89-6, Iron, analysis 7439-92-1, Lead, analysis 7440-02-0, Nickel, analysis 7440-21-3, Silicon, analysis 7440-22-4, Silver, analysis 7440-31-5, Tin, analysis 7440-36-0, Antimony, analysis 7440-38-2, Arsenic, analysis 7440-44-0, Carbon, analysis 7440-47-3, Chromium, analysis 7440-69-9, Bismuth, analysis 7440-70-2, Calcium, analysis 7704-34-9, Sulfur, analysis 7727-37-9, Nitrogen, analysis 7782-44-7, Oxygen, analysis 7782-49-2, Selenium, analysis
 RL: ANT (Analyte); ANST (Analytical study)
 (element-trace anal. in purest Cu)

IT 7440-44-0, Carbon, analysis
 RL: ANT (Analyte); ANST (Analytical study)
 (element-trace anal. in purest Cu)

L31 ANSWER 4 OF 243135 HCA COPYRIGHT 2003 ACS
 138:179838 pH Study of the Electrocatalytic SO₂ Detection at a Glassy Carbon Electrode Modified with Iron(II) tetrasulfophthalocyanine. Thamae, Mamothibane; Westbroek, Philippe; Nyokong, Tebello (Department of Chemistry, Rhodes University, Grahamstown, 6140, S. Afr.). Mikrochimica Acta, 140(3-4), 233-239 (English) 2002. CODEN: MIACAO. ISSN: 0026-3672.
 Publisher: Springer-Verlag Wien.

AB The electrocatalytic detn. of SO₂ was studied as a function of pH at a glassy C electrode modified with Fe(II) tetrasulfophthalocyanine ([Fe(II)TSPc]4-). It was found in the literature that depending on pH, SO₂.cntdot.xH₂O, HS₂O⁻ and/or SO₃²⁻ are the main compds. in soln., that these compds. behave differently at the electrode surface, and that the condition of the electrode surface is stable over the entire pH-range. The use of SO₂(g) or Na sulfite as starting material did result in identical curves except in the pH range from 7.5-9.0. A possible explanation could be given by proposing that SO₂.cntdot.xH₂O is very unstable in the presence of SO₃²⁻. In strongly acidic medium, SO₂.cntdot.xH₂O is the main compd., which can be oxidized as well as reduced with exchange of two electrons. HS₂O⁻ is the main compd. at pH = 4 and can also be oxidized and reduced with exchange of, resp., two and four electrons. In alk. soln. sulfite is the main compd. and can only be oxidized, also under exchange of two electrons. Detection limits are in the range of 4.0 .+- . 0.1 .times. 10⁻⁵ and 7.5 .+- . 0.1 .times. 10⁻⁵ mol L⁻¹, dependent of pH and of the type of reaction (oxidn. or redn.) used.

CC 79-6 (Inorganic Analytical Chemistry)
 Section cross-reference(s): 72

IT 7440-44-0, Carbon, analysis
 RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
 (glassy electrodes; pH study of the electrocatalytic SO₂ detection at a glassy carbon electrode modified with iron(II) tetrasulfophthalocyanine)

IT 7440-44-0, Carbon, analysis
 RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
 (glassy electrodes; pH study of the electrocatalytic SO₂ detection at a glassy carbon electrode modified with iron(II) tetrasulfophthalocyanine)

L31 ANSWER 5 OF 243135 HCA COPYRIGHT 2003 ACS
 138:179804 An Analogy of an Ion-Selective Electrode Sensor Based on the

Voltammetry of Microcrystals of Tetracyanoquinodimethane or Tetrathiafulvalene Adhered to an Electrode Surface. Wooster, Tim J.; Bond, Alan M.; Honeychurch, Michael J. (School of Chemistry, Monash University, 3800, Australia). Analytical Chemistry, 75(3), 586-592 (English) 2003. CODEN: ANCHAM. ISSN: 0003-2700. Publisher: American Chemical Society.

- AB The voltammetry of solid 7,7,8,8-tetracyanoquinodimethane (TCNQ) and tetrathiafulvalene (TTF) at an electrode-microparticle-aq. (electrolyte) interface generates characteristic current-potential profiles assocd. with solid-solid-phase transformations. During the reactions, electrolyte ions are included into the TCNQ (cations) and TTF (anions) lattice sites as part of the charge neutralization process. Consequently, electrolyte ion concn. is assocd. with the reversible potential of the TCNQ^{0/-} and TTF^{0/+} reactions, making these processes candidates for the development of novel voltammetric cation and anion sensors, resp. Electrode potential-analyte ion concn. dependence studies exhibited highly reproducible potential shifts of 45 (.+-1) mV/decade change in ion analyte concn. for both the TCNQ cation sensor and the TTF anion sensor. When presented with mixed-analyte solns., both ion-sensing systems exhibited a degree of ion selectivity. Ion selectivity trends may be modeled using equations based on a Nicolsky-type selectivity relation, in accordance with the concept that these are the voltammetric analogies of potentiometric ion-selective membrane electrodes.
- CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 72
- IT 7440-44-0, Carbon, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(glassy carbon disk electrode; analogy of ion-selective electrode sensor based on the voltammetry of microcrystals of tetracyanoquinodimethane or tetrathiafulvalene adhered to an electrode surface)
- IT 7440-44-0, Carbon, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(glassy carbon disk electrode; analogy of ion-selective electrode sensor based on the voltammetry of microcrystals of tetracyanoquinodimethane or tetrathiafulvalene adhered to an electrode surface)

L31 ANSWER 6 OF 243135 HCA COPYRIGHT 2003 ACS
138:179658 Synthesis and characterization of the ordered array of bamboo-like carbon nanotubes. Bao, Jian-Chun; Wang, Ke-Yu; Zhang, Ning; Xu, Zheng (State Key Laboratory of Coordination Chemistr, Nanjing University, Nanjing, 210093, Peop. Rep. China). Wuji Huaxue Xuebao, 18(11), 1097-1100 (Chinese) 2002. CODEN: WHUXEO. ISSN: 1001-4861. Publisher: Wuji Huaxue Xuebao Bianjibu.

AB The ordered array of monodispersed C nanotubes was conveniently prep'd. by pyrolysis of azobisisobutyronitrile at 600.degree. using Co as catalyst and alumina membrane as template. TEM shows that the deposited C nanotubes are bamboo-like structure and with the closed end, which is quite different from the case of that using acetylene or ethylene as C source. The formation mechanism of the bamboo-like C nanotubes is tentatively proposed and discussed.

CC 78-1 (Inorganic Chemicals and Reactions)
IT 7440-44-0P, Carbon, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(synthesis and characterization of ordered array of bamboo-like carbon nanotubes)

IT 7440-44-0P, Carbon, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)
(synthesis and characterization of ordered array of bamboo-like carbon nanotubes)

L31 ANSWER 7 OF 243135 HCA COPYRIGHT 2003 ACS
138:179623 Magnetic tapes. Ogawa, Yoichi; Yano, Akira; Mizumura, Tetsuo; Asano, Michio (Hitachi Maxell Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003051108 A2 20030221, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-236465 20010803.

AB Magnetic tapes, which comprise nonmagnetic flexible substrates, magnetic layers, and back coatings, are characterized in that C films contg. H and F are formed on the back coatings. The magnetic tapes have improved reliability.

IC ICM G11B005-735

CC 77-8 (Magnetic Phenomena)

IT 7440-44-0, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(plasma; magnetic tapes with carbon films on back coatings)

IT 7440-44-0, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(plasma; magnetic tapes with carbon films on back coatings)

L31 ANSWER 8 OF 243135 HCA COPYRIGHT 2003 ACS

138:179605 Bonding and mechanical properties of ultrathin diamond-like carbon films. Beghi, M. G.; Ferrari, A. C.; Teo, K. B. K.; Robertson, J.; Bottani, C. E.; Libassi, A.; Tanner, B. K. (INFM and Nuclear Engineering Department, Politecnico di Milano, Milan, I-20133, Italy). Applied Physics Letters, 81(20), 3804-3806 (English) 2002. CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.

AB Ultrathin 2-nm-thick C coatings are needed to increase the storage d. in magnetic hard disks. X-ray reflectivity, surface Brillouin scattering, resonant Raman scattering, and EELS can measure consistently the structural and mech. properties of these thin films. 2 Nm films retain a Young's modulus of 100 GPa.

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 66

IT 7440-44-0, Carbon, properties

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(diamondlike; bonding and mech. properties of ultrathin diamond-like carbon films for magnetic hard disks)

IT 7440-44-0, Carbon, properties

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(diamondlike; bonding and mech. properties of ultrathin diamond-like carbon films for magnetic hard disks)

L31 ANSWER 9 OF 243135 HCA COPYRIGHT 2003 ACS

138:179581 Nuclear magnetic resonance of molecular hydrogen trapped in single-walled carbon nanotube bundles. Shiraishi, Masashi; Ata, Masafumi (Materials Laboratories, SONY Corporation, Yokohama, 240-0036, Japan). Journal of Nanoscience and Nanotechnology, 2(5), 463-465 (English) 2002. CODEN: JNNOAR. Publisher: American Scientific Publishers.

AB Mol. dynamics of H trapped in single-walled C nanotube bundles was analyzed by NMR. The chem. shift of H was .apprx.5.1 ppm at 293 K, which is similar to that of H₂O. The relaxation time, T₁, was .apprx.0.1-0.2 s. Values in this work are comparable to those for H loaded in SiO₂ and a-Si.

CC 77-7 (Magnetic Phenomena)

Section cross-reference(s): 66

IT 7440-44-0, Carbon, properties

- RL: PRP (Properties)
(nanotubes; mol. dynamics of hydrogen trapped in single-walled carbon nanotube bundles analyzed by NMR)
- IT **7440-44-0**, Carbon, properties
RL: PRP (Properties)
(nanotubes; mol. dynamics of hydrogen trapped in single-walled carbon nanotube bundles analyzed by NMR)
- L31 ANSWER 10 OF 243135 HCA COPYRIGHT 2003 ACS
138:179522 Self-assembled structures of gas-phase prepared FePt nanoparticles.
Rellinghaus, Bernd; Stappert, Sonja; Acet, Mehmet; Wassermann, Eberhard F.
(Experimentelle Tieftemperaturphysik und Sonderforschungsbereich 445,
Gerhard-Mercator-Universitat, Duisburg, D-47048, Germany). Materials
Research Society Symposium Proceedings, 707(Self-Assembly Processes in
Materials), 239-249 (English) 2002. CODEN: MRSPDH. ISSN: 0272-9172.
Publisher: Materials Research Society.
- AB The authors report on a non-lithog. method for the prepn. of self-assembled FePt nanoparticles via inert-gas condensation. Prior to deposition the particles can be sintered in flight at temps. as high as TS = 1273 K. Whereas un-sintered particles have irregular shapes, particles sintered at elevated temps. TS >treq. 793 K show a regular faceting. (High resoln.) TEM ((HR)TEM) shows that these regularly faceted particles are of icosahedral structure. When being deposited onto amorphous C films, the gas-phase sintered particles have a high mobility. In particular, for the high-temp. sintered FePt nanoparticles, this mobility gives particle arrays with hcp. arrangements. Within these ordered patches, the particles are sepd. from one another. Anal. studies using energy filtered TEM (EFTEM) show that a C layer is formed between the particles. Magnetization analyses give results showing that the gas-phase sintered particles are superparamagnetic at room temp. with a blocking temp. of TB = 49 K.
- CC 77-1 (Magnetic Phenomena)
- IT **7440-44-0**, Carbon, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(amorphous substrate; self-assembled structures of gas-phase sintered FePt nanoparticles and their magnetic properties)
- IT **7440-44-0**, Carbon, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(amorphous substrate; self-assembled structures of gas-phase sintered FePt nanoparticles and their magnetic properties)
- L31 ANSWER 11 OF 243135 HCA COPYRIGHT 2003 ACS
138:179483 Magnetic properties of Fe-xMo-5Ni-0.05C alloys ($x=5, 8, 11$ and 15 wt.%). Souza, M. C. L.; Teodosio, J. R.; Neto, J. M.; Tavares, S. S. M. (Dept. de Engenharia Metalurgica e Materiais, COPPE/UFRJ, Rio de Janeiro, 21945-970, Brazil). Journal of Alloys and Compounds, 346(1-2), 272-275 (English) 2002. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..
- AB The magnetic properties of Fe-xMo-5Ni-0.05C ($x = 5, 8, 11$ and 15%) were studied. The alloys were soln. treated at 1200.degree. and aged at 610.degree. for magnetic (and mech.) hardening. The satn. induction (Bs) decreases and the coercive force (Hc) increases with the increase of the Mo concn. The Bs values also decrease during the aging of the alloys when the Mo concn. is $>5\%$. The residual induction (Br) was max. in the alloy with 11%Mo. Some increase in the Br values was obtained by a cold deformation step prior to aging. Thermomagnetic anal. (TMA) shows that, as expected, the Curie temp. (TC) decreases with the increase of the Mo concn. A pptn. effect due to thermal annealing was obsd. in the alloys of

- higher Mo concn. tested with low heating rate.
- CC 77-1 (Magnetic Phenomena)
Section cross-reference(s): 51
- IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(iron-molybdenum-nickel dopant; magnetic properties of
iron-molybdenum-nickel-carbon aged alloys)
- IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(iron-molybdenum-nickel dopant; magnetic properties of
iron-molybdenum-nickel-carbon aged alloys)
- L31 ANSWER 12 OF 243135 HCA COPYRIGHT 2003 ACS
138:179418 Nanometer scale interfacial lubrication of PFPE lubricants Z-DOL
and AWA at head disk interface. Wang, Wei; Lan, Zhong-Wen; Ji, Hong;
Wang, Hao-Cai (Institute of Microelectronics and Solid State Electronics,
University of Electronics Science and Technology of China, Chengdu,
610054, Peop. Rep. China). International Journal of Nonlinear Sciences
and Numerical Simulation, 3(3-4), 511-514 (English) 2002. CODEN: IJNSF5.
ISSN: 1565-1339. Publisher: Freund Publishing House.
- AB We investigated the tribol. performance of poly(fluoroalkymethacrylate),
which was usually used as anti-wetting agent (AWA). The decompn. of
lubricant Z-DOL and the influence of AWA on decompn. or degrdn. of
lubricant Z-DOL was investigated in details. The possible mechanics of
the decompn. of PFPE lubricants Z-DOL and of the interaction among the
AWA, Z-DOL, diamond-like C (DLC) layer and chem. environment at head disk
interface (HDI) was also discussed. Exptl. results show that lubricant
Z-DOL is easily picked up by the heads, and Z-DOL degraded thermally
caused by friction forces at HDI. AWA on magnetic heads could reduce the
meniscus formation and could block the transfer of lubricant Z-DOL from
media.
- CC 77-1 (Magnetic Phenomena)
Section cross-reference(s): 51
- IT 7440-44-0, Carbon, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); TEM (Technical or engineered material use); PROC
(Process); USES (Uses)
(diamond-like; nanometer scale interfacial lubrication of PFPE
lubricants Z-DOL and AWA at magnetic head-disk interface coated by)
- IT 7440-44-0, Carbon, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); TEM (Technical or engineered material use); PROC
(Process); USES (Uses)
(diamond-like; nanometer scale interfacial lubrication of PFPE
lubricants Z-DOL and AWA at magnetic head-disk interface coated by)
- L31 ANSWER 13 OF 243135 HCA COPYRIGHT 2003 ACS
138:179371 Overcoat for hard disk medium - preparation and evaluation -.
Fujimaki, Shigehiko; Kokaku, Yuichi (Data Storage Systems Division,
Hitachi, Ltd., Odawara-shi, Kanagawa, 256-8510, Japan). Hyomen Gijutsu,
53(12), 878-880 (Japanese) 2002. CODEN: HYGIEX. ISSN: 0915-1869.
Publisher: Hyomen Gijutsu Kyokai.
- AB A review including fabrication and evaluation of carbon protective films.
- CC 77-0 (Magnetic Phenomena)
- IT 7440-44-0, Carbon, properties
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,
engineering or chemical process); PRP (Properties); PROC (Process); USES
(Uses)
(prepn. and evaluation of overcoat for hard disk medium)
- IT 7440-44-0, Carbon, properties

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(prep. and evaluation of overcoat for hard disk medium)

L31 ANSWER 14 OF 243135 HCA COPYRIGHT 2003 ACS
138:179302 Field electron emission devices using intercalated carbon materials. Burden, Adrian Paul; Baigrie, Stephen Michael (Printable Field Emitters Limited, UK). Brit. UK Pat. Appl. GB 2379079 A1 20030226, 39 pp. (English). CODEN: BAXXDU. APPLICATION: GB 2002-5636 20020311. PRIORITY: GB 2001-6358 20010313.

AB This invention relates to field electron emission materials, and devices using such materials. Graphite comprises atoms arranged in discrete layers. The perpendicular distance between these layers is the d-spacing. A field emission material is obtained by expanding the d-spacing. Such expansion may be achieved by an intercalant that has been introduced between layers of the material. Such an intercalant may reside, or may no longer reside, in the material. The material may be placed in position on a substrate by a printing process, prior to expansion. Such field emission material may be used in cold cathodes in field electron emission devices.

IC ICM H01J001-30
ICS H01J009-02

CC 76-12 (Electric Phenomena)
Section cross-reference(s): 73

IT 7440-44-0, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(nanotubes; field electron emission devices using intercalated carbon materials)

IT 7440-44-0, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(nanotubes; field electron emission devices using intercalated carbon materials)

L31 ANSWER 15 OF 243135 HCA COPYRIGHT 2003 ACS

138:179299 Design of a carbon-based field emission array. Windischmann, Henry; Schueller, Randolph D.; Zollers, Brian G.; Jamison, Keith D.; Patterson, Donald E. (Extreme Devices Incorporated, USA). PCT Int. Appl. WO 2003017310 A1 20030227, 26 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-US25171 20020808. PRIORITY: US 2001-933031 20010820.

AB The invention relates to the design of a carbon-based field emission array having more uniform electron emission over the area of the array. The emission uniformity is made possible by a resistive layer that is present below each of the emission tips. The field emission app. consists of (i) an array of carbon-based emitter tips; (ii) a resistive layer contacting the array of emitter tips, where the resistive layer has an elec. resistance greater than that of the array, such that the current flow through the emitter tips is limited by the resistive layer; and (iii) an elec. conductive backing layer in contact with the opposing side of the resistive layer.

IC ICM H01J001-304

CC 76-12 (Electric Phenomena)
Section cross-reference(s): 56, 74, 75

- IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(diamond-like, emission material; design of a carbon-based field emission array)
- IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(diamond-like, emission material; design of a carbon-based field emission array)

L31 ANSWER 16 OF 243135 HCA COPYRIGHT 2003 ACS
138:179297 Reduction of charging effect and carbon deposition caused by electron beam devices. Yang, Baorui (Micron Technology Inc., USA). U.S. US 6525317 B1 20030225, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1998-222999 19981230.

AB A method and an app. are presented for reducing the charging effect of electron beam devices on non-conducting samples includes introducing a H₂O contg. gas on the sample surface. Because the H₂O contg. gas is conductive, the charge is dissipated. The H₂O contg. gas may be introduced by a nozzle and the pressure may be adjusted to provide an amt. of H₂O contg. gas sufficient to dissipate the charging effect produced by the electron beam. In a preferred embodiment, the H₂O contg. gas is H₂O vapor. This technique is esp. useful for inspection of quartz samples such as quartz photomasks with scanning electron microscopes because H₂O vapor exhibits good adhesion to quartz surfaces, which helps to distribute and dissipate the charge quickly. A method for reducing C deposition caused by an electron beam device also involves introducing a H₂O contg. gas on the sample surface. This method is effective for both conductive and nonconductive samples.

- IC ICM G01N023-00
NCL 250310000; 290306000
CC 76-12 (Electric Phenomena)
Section cross-reference(s): 73
- IT **7440-44-0**, Carbon, occurrence
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(redn. of charging effect and carbon deposition caused by electron beam devices)
- IT **7440-44-0**, Carbon, occurrence
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(redn. of charging effect and carbon deposition caused by electron beam devices)

L31 ANSWER 17 OF 243135 HCA COPYRIGHT 2003 ACS
138:179295 Cathode ray tubes. Goto, Hiroyuki (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2003051275 A2 20030221, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-239211 20010807.

AB Cathode ray tubes have panels and funnels shielded with frits, have funnel interior coated with C, include anode high-voltage supply parts on the funnels, and contain mask frames, shields, getters and electron guns inside. Gettering films are formed by dispersion of getters at a distance from the anode high-voltage supply parts. The C coatings can maintain high elec. resistance.

IC ICM H01J029-94
CC 76-12 (Electric Phenomena)
Section cross-reference(s): 74

IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(cathode ray tubes contg. carbon coatings on funnel interior and gettering films)

IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)

(cathode ray tubes contg. carbon coatings on funnel interior and gettering films)

L31 ANSWER 18 OF 243135 HCA COPYRIGHT 2003 ACS
138:179282 Coated silicon electrode plate for plasma etching. Yonehisa, Takashi; Kato, Norichika (Mitsubishi Materials Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2003051485 A2 20030221, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-236065 20010803.

AB A silicon electrode plate having a no. of through holes in its thickness direction for plasma etching is coated with a SiC film or diamondlike C film to increase its service lifetime.

IC ICM H01L021-3065

CC 76-11 (Electric Phenomena)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(diamondlike; coated silicon electrode plate for plasma etching)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(diamondlike; coated silicon electrode plate for plasma etching)

L31 ANSWER 19 OF 243135 HCA COPYRIGHT 2003 ACS

138:179269 Carbon-bonded metal structures and methods of fabrication. Rasmussen, Paul S. (Powerstor Corporation, USA). U.S. US 6524707 B1 20030225, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 2000-611040 20000706. PRIORITY: US 1999-PV143189 19990709.

AB Provided is a technique in which a carbon structure is first coated with a tie layer as a intermediate prior to the deposition of metal on a carbon substrate. The tie layer is composed of a material with structural and chem. affinity for both carbon and metal. Capacitor electrodes formed according to this technique show very low Equiv. Series Resistance (ESR) and improved capacitance at high frequencies.

IC ICM B33B009-00

NCL 428408000; 428446000; 428698000; 428699000

CC 76-10 (Electric Phenomena)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(fabrication of carbon-bonded metal structures for use as capacitor electrodes)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(fabrication of carbon-bonded metal structures for use as capacitor electrodes)

L31 ANSWER 20 OF 243135 HCA COPYRIGHT 2003 ACS

138:179262 Double-layer capacitor, capacitor electrode, and apparatus for filling electrolyte. Ishida, Akira; Okumura, Eiji; Takeda, Toshikazu; Ushio, Yosuke; Takahashi, Masahiro (Isuzu Motors, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003051429 A2 20030221, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-236295 20010803.

AB A double-layer capacitor having a low internal resistance comprises a sheet-shaped and C-based electrode bonded to a collector with a mixt. contg. a C fine powder and carbon fibers having a fiber length 0.01 - 0.5 mm. An app. is also described, for filling a capacitor element with an electrolyte without wasting the electrolyte.

IC ICM H01G009-058

ICS H01G009-016; H01G009-155; H01G013-00

CC 76-10 (Electric Phenomena)

Section cross-reference(s): 47

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)

(bonding mixt. for collector and electrode of double-layer capacitor
and app. for filling electrolyte)

IT **7440-44-0**, Carbon, uses

RL: DEV (Device component use); USES (Uses)

(bonding mixt. for collector and electrode of double-layer capacitor
and app. for filling electrolyte)

L31 ANSWER 21 OF 243135 HCA COPYRIGHT 2003 ACS

138:179125 Mold apparatus used during semiconductor device fabrication.

Westmoreland, Donald L. (Micron Technology, Inc., USA). U.S. US 6523803
B1 20030225, 8 pp. (English). CODEN: USXXAM. APPLICATION: US
1998-146853 19980903.

AB The present invention relates to modifying the surface of a mold used for formation of planar surfaces during fabrication of semiconductor devices. Surface modifications of a mold used during semiconductor device fabrication provide nonstick characteristics and a mold surface that is resistant to abrasion or wear. Such surface modifications are particularly useful in a mold having a quartz planar surface adapted to contact a photocurable polymer material applied to a semiconductor wafer surface during a fabrication process. The planar surface of the mold is capable of allowing transmission of UV light to cure the polymer material. A nonstick film is formed on the planar surface of the mold by a coating or deposition process to modify the mold surface. The nonstick film can be formed of a fluoroalkylsilane compd., or a hard material such as diamond or diamond-like C. The nonstick film of diamond or diamond-like C provides protection against abrasion or wear on the planar surface of the mold. The nonstick film of diamond or diamond-like C can be F-terminated, or can have a coating layer of a fluoroalkylsilane compd. formed thereover.

IC ICM B29C033-56

NCL 249114100; 106038220; 106038280; 249115000; 425174400

CC 76-3 (Electric Phenomena)

IT **7440-44-0**, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(diamond-like; mold app. used during semiconductor device fabrication)

IT **7440-44-0**, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(diamond-like; mold app. used during semiconductor device fabrication)

L31 ANSWER 22 OF 243135 HCA COPYRIGHT 2003 ACS

138:179100 Method of fabricating a semiconductor using ion implantation in a SiC layer. Eriksen, Odd Harald Steen; Guo, Shuwen (USA). U.S. Pat. Appl. Publ. US 2003036247 A1 20030220, 19 pp. (English). CODEN: USXXCO.
APPLICATION: US 2001-932001 20010817.

AB The invention relates to a method of fabricating a semiconductor using ion implantation in a SiC layer for use in high-temp. instrumentation and pressure sensing devices. The method consists of steps of (i) providing a first material consisting of a silicon wafer, a SiC conversion layer obtained by converting a portion of the silicon to SiC, a layer of non-indigenous SiC applied to the conversion layer, and an oxide layer applied to the non-indigenous SiC layer; (ii) implanting ions in a region of the non-indigenous SiC layer, thereby establishing an implant region which defines a first portion of the non-indigenous SiC layer and a second portion of the non-indigenous SiC layer; (iii) providing at least one addnl. material consisting of a second silicon wafer and an oxide layer applied to the face of the second wafer; (iv) bonding the oxide layer of the first material and oxide layer of the second material to provide an assembly; and (v) sepg. at the implant region the second portion of the non-indigenous SiC layer from the first portion of the non-indigenous SiC layer.

IC ICM H01L021-00
NCL 438455000
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 47
IT 1333-74-0, Hydrogen, processes 7440-38-2, Arsenic, processes
7440-42-8, Boron, processes 7440-44-0, Carbon, processes
7723-14-0, Phosphorus, processes 7727-37-9, Nitrogen, processes
7782-41-4, Fluorine, processes
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(dopant; method of fabricating a semiconductor using ion implantation in a SiC layer)
IT 7440-44-0, Carbon, processes
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(dopant; method of fabricating a semiconductor using ion implantation in a SiC layer)

L31 ANSWER 23 OF 243135 HCA COPYRIGHT 2003 ACS
138:179067 Electromagnetic wave absorption devices and manufacture of materials thereof. Kawase, Koichi; Komatsu, Ryosuke (Japan). Jpn. Kokai Tokkyo Koho JP 2003051695 A2 20030221, 5 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2001-237855 20010806.

AB The title devices comprise a perforated shape-deformable bag, sintered electromagnetic wave-absorbing sintered particles packed in the bag, and a grounding wire connected to the packed particles attached through the perforation of the bag. The manuf. of the electromagnetic wave-absorbing sintered particles involves (1) kneading a mixt. contg. C 10-50, ceramic material 20-60, dolomite 5-25, and tourmaline 5-25 wt.%, (2) granulating the kneaded mixt., and (3) sintering the granules for 8-12 h at 1100-1250.degree.. The devices are shape-deformable, simple structure, and light wt. for fitting any shapes of elec. components.

IC ICM H05K009-00
ICS H01F001-00
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 57
IT 7440-44-0, Carbon, properties 16389-88-1, Dolomite, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(sintered mixt. granular; electromagnetic wave absorption sintered materials and devices and manufg.)
IT 7440-44-0, Carbon, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(sintered mixt. granular; electromagnetic wave absorption sintered materials and devices and manufg.)

L31 ANSWER 24 OF 243135 HCA COPYRIGHT 2003 ACS
138:179060 photovoltaic devive. Ootake, Naoto; Odawara, Osamu; Yoshimoto, Mamoru (Rikogaku Shinkokai, Japan). Jpn. Kokai Tokkyo Koho JP 2003051603 A2 20030221, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-236594 20010803.

AB The invention relates to a semiconductor photovoltaic device, suited for use as solar cells or imaging devices, comprising an i-type carbon film and a p-type carbon film formed on an amorphous silicon substrate.
IC ICM H01L031-04
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 52, 74
IT 7440-21-3, Silicon, uses 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(semiconductor photovoltaic device)
IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(semiconductor photovoltaic device)

L31 ANSWER 25 OF 243135 HCA COPYRIGHT 2003 ACS
138:179040 Design of a microwave field effect transistor structure on a silicon carbide substrate. D'anna, Pablo; Johnson, Joseph H. (Sirenza Microdevices, Inc., USA). U.S. US 6521923 B1 20030218, 21 pp. (English). CODEN: USXXAM. APPLICATION: US 2002-156221 20020525.

AB The invention relates to the design of a microwave field effect transistor structure on a silicon carbide substrate that advances frequency capabilities and diminishes gate-to-drain capacitance. A microwave transistor structure consists of (i) a SiC substrate; (ii) a silicon semiconductor material of a first cond. type overlaying the top surface of the substrate; (iii) a conductive gate overlying and insulated from the semiconductor layer; (iv) a channel region of the first cond. type formed within the silicon semiconductor material; (v) a drain region of a second cond. type formed in the silicon semiconductor material and contacting the channel region; (vi) a body region of the first cond. type; (vii) a source region of the second cond. type; (viii) a shield plate region lying adjacent and parallel to the drain region, where the shield plate region is adjacent and parallel to the conductive gate region, and where the shield plate extends above the top surface of the silicon semiconductor material to a shield plate height level, and is insulated from the silicon semiconductor material; and (ix) a conductive plug region formed in the body region of the silicon semiconductor material to connect the lateral surface of the body region to the top surface of the substrate.

IC ICM H01L031-119

ICS H01L029-00

NCL 257288000; 257285000; 257213000; 257275000; 257341000; 257368000;
257389000; 257508000

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 73

IT 7440-44-0, Carbon, uses 7631-86-9, Silica, uses

RL: DEV (Device component use); USES (Uses)
(bonding layer; design of a microwave field effect transistor structure on a silicon carbide substrate)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(bonding layer; design of a microwave field effect transistor structure on a silicon carbide substrate)

L31 ANSWER 26 OF 243135 HCA COPYRIGHT 2003 ACS

138:178995 Conductive silicone rubber compositions. Igarashi, Minoru; Koike, Yoshiaki; Yaginuma, Atsushi; Nakamura, Tsutomu (Shin-Etsu Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003059341 A2 20030228, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-244799 20010810.

AB The title compns. comprise 100 wt.-parts organopolysiloxane RaSiO(4-a)/2 (R = monovalent hydrocarbon; a = 1.90-2.05) and 50-500 wt.-parts Ni-coated carbon particles which are dispersed in polysiloxane to give conductive silicone rubber. The conductive silicone rubber may be galvanized are longtime duration. The compns. are electromagnetic shielding as well as elec. conductive.

IC ICM H01B001-22

ICS C08K005-14; C08K009-02; C08L083-04; H01B001-00; H05K009-00

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 39, 56

IT 7440-44-0, Carbon, properties

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(particles, nickel-coated; conductive silicone rubber compns.)

IT **7440-44-0**, Carbon, properties

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(particles, nickel-coated; conductive silicone rubber compns.)

L31 ANSWER 27 OF 243135 HCA COPYRIGHT 2003 ACS

138:178958 Nanostructured carbon capsules with hollow core/mesoporous shell structure. Yu, Jong-Sung; Yoon, Suk Bon; Sohn, Kwonnam; Kim, Jeong Yeon; Hyeon, Taeghwan (Department of Chemistry and Institute of Infor-Bio-Nano Materials, Hannam University, Taejon, 306-791, S. Korea). Materials Research Society Symposium Proceedings, 728(Functional Nanostructured Materials through Multiscale Assembly and Novel Patterning Techniques), 241-246 (English) 2002. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB Carbon capsules with a hollow macroporous core/mesoporous shell were synthesized using sacrificial submicrometer-size solid core/mesoporous shell (SCMS) silica spheres as templates. The size of the hollow macroporous core and thickness of the mesoporous shell can be easily controlled by the choice of silica spheres and the amt. of TEOS/C18-TMS mixt., resp.

CC 76-14 (Electric Phenomena)

IT **7440-44-0**, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(nanostructured carbon capsules with hollow core/mesoporous shell structure)

IT **7440-44-0**, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(nanostructured carbon capsules with hollow core/mesoporous shell structure)

L31 ANSWER 28 OF 243135 HCA COPYRIGHT 2003 ACS

138:178939 Carbon nanotube on a silicon tip for electron field emitter. Minh, Phan Ngoc; Tuyen, Le T. T.; Ono, Takahito; Mimura, Hidenori; Yokoo, Kuniyoshi; Esashi, Masayoshi (Venture Business Laboratory, Tohoku University, Sendai, 980-8579, Japan). Japanese Journal of Applied Physics, Part 2: Letters, 41(12A), L1409-L1411 (English) 2002. CODEN: JAPLD8. Publisher: Japan Society of Applied Physics.

AB In this letter, the results of selective growth and electron field emission characterization of an individual carbon nanotube on a Si tip are presented. An individual, multiwall carbon nanotube was grown vertically at the apex of a microfabricated Si tip using hot-filament CVD deposition with a mixt. of C₂H₂ and H₂ gases. During the growth process, an elec. field of 5 .times. 10⁴ V/m was applied between the Si tip and a filament to elec. enhance the growth of the carbon nanotube from the apex of the tip. Carbon nanotubes with a diam. of 4-25 nm and a length of 300-400 nm were vertically aligned from the apex of the Si tip. Electron field emission characteristics of the single Si tip with and without the individual carbon nanotube on the same substrate were measured at room temp. in a vacuum of 1.7 .times. 10⁻⁴ Pa. The threshold voltages were approx. 40 V (4 V/.mu.m) and 200 V (20 V/.mu.m) for the Si tips with and without the carbon nanotube, resp.

CC 76-12 (Electric Phenomena)

IT **7440-44-0P**, Carbon, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)
(nanotubes; carbon nanotube on Si tip for electron field emitter)

IT **7440-44-0P**, Carbon, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)
(nanotubes; carbon nanotube on Si tip for electron field emitter)

L31 ANSWER 29 OF 243135 HCA COPYRIGHT 2003 ACS

138:178938 Structure and field electron emission of carbon nanotubes dependent

on growth temperature. Huh, Yoon; Lee, Jeong Yong; Lee, Tae Jae; Lyu, Seung Chul; Lee, Cheol Jin (Dept. of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon, 305-701, S. Korea). Materials Research Society Symposium Proceedings, 728(Functional Nanostructured Materials through Multiscale Assembly and Novel Patterning Techniques), 127-131 (English) 2002. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB This present work deals with the temp. dependence on the growth and structure of CNTs grown by thermal CVD. The vertically aligned CNTs were synthesized on iron (Fe)-deposited silicon oxide (SiO₂) substrate by thermal CVD using acetylene gas at temps. in the range 750-950.degree.. Configuration and structural characteristics of CNTs were studied using SEM and TEM. As the growth temp. increases from 750 to 950.degree., the growth rate and the av. diam. increase while the d. decreases by a factor of .apprx.2. TEM images show that the relative amt. of cryst. graphitic sheets increases with increasing the growth temp. and a higher degree of cryst. perfection can be achieved at 950.degree.. The HRTEM images reveal consistently that the degree of cryst. perfection increases progressively as the growth temp. increases. The growth rate, diam., d., and crystallinity of carbon nanotubes can be controlled with the growth temp.

CC 76-12 (Electric Phenomena)

IT 7440-44-0, Carbon, properties

RL: PRP (Properties)

(nanotubes; growth temp. dependence of structure and field electron emission of carbon nanotubes on iron deposited silica substrate)

IT 7440-44-0, Carbon, properties

RL: PRP (Properties)

(nanotubes; growth temp. dependence of structure and field electron emission of carbon nanotubes on iron deposited silica substrate)

L31 ANSWER 30 OF 243135 HCA COPYRIGHT 2003 ACS

138:178937 Field emission characteristics of carbon nanotubes synthesized by C3H₄ and NH₃ gases. Jeong, Taewon; Han, Jae Hee; Yi, Whikun; Yu, SeGi; Lee, Jeonghee; Heo, Jungna; Lee, Chang Soo; Yoo, Ji-Beom; Kim, J. M. (The National Creative Research Initiatives, Center for Electron Emission Source, Samsung Advanced Institute of Technology, Suwon, 440-600, S. Korea). Materials Research Society Symposium Proceedings, 727(Nanostructured Interfaces), 177-182 (English) 2002. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB By using a gas mixt. of propyne (C3H₄) and ammonia (NH₃) as a carbon precursor, the authors have successfully synthesized multiwalled carbon nanotubes (CNTs) by d.c. PECVD deposition onto Co-sputtered glass at 550.degree.. As the flow ratio of NH₃ to C3H₄ in the mixt. gas increased, the crystallinity and alignment of CNTs were improved. In addn., the field emission characteristics of the CNTs were also improved - the turn-on voltage became lower, and the c.d. and the field enhancement factor increased more. Raman spectroscopy and SEM were utilized to confirm the effect of the gas flow ratio on CNTs. Therefore, the gas flow ratio was found to be one of important factors to govern the cryst. and field-emission characteristics of CNTs. The growth mechanism of the CNTs using a C3H₄ gas is under investigation with the possibility that three carbon atoms in a C3H₄ mol. is converted directly to a hexagon of a CNT by combining two mols.

CC 76-12 (Electric Phenomena)

IT 7440-44-0P, Carbon, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(nanotubes; field emission characteristics of carbon nanotubes synthesized by C3H₄ and NH₃ gases)

IT 7440-44-0P, Carbon, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(nanotubes; field emission characteristics of carbon nanotubes synthesized by C₃H₄ and NH₃ gases)

- L31 ANSWER 31 OF 243135 HCA COPYRIGHT 2003 ACS
 138:178915 Measurements of atomic carbon density in processing plasmas by vacuum ultraviolet laser absorption spectroscopy. Tanaka, Norifusa; Tachibana, Kunihide (Department of Electronic Science and Engineering, Kyoto University, Yoshida-Honmachi, Sakyo-ku, Kyoto, 606-8501, Japan). Journal of Applied Physics, 92(10), 5684-5690 (English) 2002. CODEN: JAPIAU. ISSN: 0021-8979. Publisher: American Institute of Physics.
- AB Measurements of the abs. C atom d. in an inductively coupled plasma (ICP) source were carried out by using vacuum UV (VUV) laser absorption spectroscopy with the resonance lines of C atoms at wavelengths around 94.5 and 165.7 nm. A tunable VUV laser covering these wavelength ranges was generated by a two-photon resonance/four-wave mixing technique in Xe gas. No absorption at around 94.5 nm could be obsd., but from the absorption spectra around 165.7 nm we successfully derived the abs. d. of C atoms in the ICP source. The obtained values varied from 1.times.10¹⁰ to 1.times.10¹¹ cm⁻³, depending on the source gas and operating conditions of the plasma source. The relatively small d. values compared to other at. species are attributed to the large loss rates, which mostly occur on the surface.
- CC 76-11 (Electric Phenomena)
 Section cross-reference(s): 79
- IT 7440-44-0, Carbon, properties
 RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
 (measurements of at. carbon d. in processing plasmas by vacuum UV laser absorption spectroscopy)
- IT 7440-44-0, Carbon, properties
 RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
 (measurements of at. carbon d. in processing plasmas by vacuum UV laser absorption spectroscopy)

=> d L51 1-15 cbib abs hitind hitrn

- L51 ANSWER 1 OF 15 HCA COPYRIGHT 2003 ACS
 137:297854 Soft stainless steel sheet suitable for deep-drawing formability or cold forging. Ishikawa, Hanji; Otsuka, Masato; Suzuki, Satoshi; Tanaka, Hideki; Katsuki, Junichi; Yamauchi, Takashi; Hiramatsu, Naoto (Nisshin Steel Co., Ltd., Japan). Eur. Pat. Appl. EP 1249513 A1 20021016, 23 pp.
 DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2002-8138 20020411. PRIORITY: JP 2001-113724 20010412; JP 2002-6355 20020115.

AB The austenitic stainless steel sheet with decreased hardness for deep-drawing formability typically contains C and N at .1toreq.0.06 total, Si .1toreq.2.0, Mn .1toreq.5, Cr 15-20, Ni 5-9, Cu 1.0-4.0, Al .1toreq.0.003, and S .1toreq.0.005%, optionally with Ti .1toreq.0.5, Nb .1toreq.0.5, Zr .1toreq.0.5, V .1toreq.0.5, Mo .1toreq.3.0, B .1toreq.0.03, rare-earth metals .1toreq.0.02, and/or Ca .1toreq.0.03%. The inclusions in stainless steel are at .gtoreq.70% of the MnO-SiO₂-Al₂O₃ type contg. .gtoreq.15% SiO₂ and .1toreq.40% Al₂O₃. The stainless steel sheets show strain-hardening exponent of 0.40-0.55 in tensile test with true stain-true stress curve, and elongation .gtoreq.50%. The typical stainless steel for sheets 0.4 mm thick having tensile strength of 511 MPa, yield strength 220 MPa, elongation 55%, and Vickers microhardness of 111 contains C 0.014, N 0.021, Si 0.37, Mn 1.69, Cr 16.90, Ni 7.91, Cu 3.20, Mo 0.10, and S 0.001%.

IC ICM C22C038-42
ICS C21D008-04
CC 55-3 (Ferrous Metals and Alloys)
ST stainless steel alloying **austenitic** sheet formability
IT 468054-19-5 468054-20-8
RL: TEM (Technical or engineered material use); USES (Uses)
(**austenitic**, alloying of; stainless steel sheet with
decreased hardness for deep-drawing formability)
IT 259735-45-0 437604-81-4 437604-84-7
437604-86-9 468054-21-9 468054-22-0
468054-23-1 468054-24-2 468054-25-3
468054-26-4 468054-27-5 468054-28-6
468054-29-7 468054-30-0 468054-31-1
468054-32-2 468054-33-3
RL: PRP (Properties)
(**austenitic**; stainless steel with controlled inclusions and
decreased hardness for deep drawing)
IT 468054-19-5 468054-20-8
RL: TEM (Technical or engineered material use); USES (Uses)
(**austenitic**, alloying of; stainless steel sheet with
decreased hardness for deep-drawing formability)
IT 259735-45-0 437604-81-4 437604-84-7
437604-86-9 468054-21-9 468054-23-1
468054-24-2 468054-25-3 468054-26-4
468054-27-5 468054-28-6 468054-29-7
468054-30-0 468054-31-1 468054-33-3
RL: PRP (Properties)
(**austenitic**; stainless steel with controlled inclusions and
decreased hardness for deep drawing)

L51 ANSWER 2 OF 15 HCA COPYRIGHT 2003 ACS

137:81873 **Austenitic** stainless steel with controlled oxide
inclusions for decreased crack sensitivity during sheet press forming.
Katsuki, Junichi; Iida, Teruyoshi; Yamauchi, Takashi; Suzuki, Satoshi;
Hiramatsu, Naoto (Nissin Steel Co., Ltd., Japan). Eur. Pat. Appl. EP
1221494 A1 20020710, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK,
ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK,
CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2001-127493
20011128. PRIORITY: JP 2001-1192 20010109.

AB The **austenitic** stainless steel contains C .1toreq.0.4,
Si 0.1-1.0, Mn .1toreq.5.0, Cr 15-20, Ni 5-9, Cu 1.0-5.0, N .1toreq.0.035,
S .1toreq.0.006, and Al .1toreq.0.003%. The stainless steel
microstructure contains dispersed MnO-**SiO₂-Al₂O₃**
inclusions with .gtoreq.15% **SiO₂** and .1toreq.40% **Al₂O₃**
, avoiding the presence of MnO-Cr₂O₃ inclusions. The molten stainless
steel in refining is covered with a basic slag, and is strongly deoxidized
in vacuum or non-oxidizing atm. with ferrosilicon alloy contg.
.1toreq.1.0% Al. The **austenitic** stainless steel is suitable for
thin (0.3 mm) sheets that can be press formed without cracks. The typical
stainless steel contains C 0.034, Si 0.42, Mn 1.95, Cr 18.35, Ni
6.01, Cu 3.94, N 0.009, S 0.0036, and Al 0.002%.

IC ICM C22C038-42
ICS C22C038-58; C21C007-06
CC 55-3 (Ferrous Metals and Alloys)
ST **austenitic** stainless steel deoxidn sheet formability
IT Slags
(basic, stainless steel melt covered with; **austenitic**
stainless steel with controlled oxide inclusions for decreased crack
sensitivity of sheets in press forming)
IT 440626-42-6

RL: TEM (Technical or engineered material use); USES (Uses)
 (alloying of; austenitic stainless steel with controlled
 oxide inclusions for decreased crack sensitivity of sheets in press
 forming)

IT 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (atm., stainless steel melt refined under; austenitic
 stainless steel with controlled oxide inclusions for decreased crack
 sensitivity of sheets in press forming)

IT 157353-93-0, Aluminum manganese silicon oxide
 RL: TEM (Technical or engineered material use); USES (Uses)
 (inclusions; austenitic stainless steel with controlled oxide
 inclusions for decreased crack sensitivity of sheets in press forming)

IT 198487-27-3 198487-29-5 440626-43-7
 440626-44-8 440626-45-9 440626-46-0
 RL: TEM (Technical or engineered material use); USES (Uses)
 (microalloyed; austenitic stainless steel with controlled
 oxide inclusions for decreased crack sensitivity of sheets in press
 forming)

IT 440626-42-6
 RL: TEM (Technical or engineered material use); USES (Uses)
 (alloying of; austenitic stainless steel with controlled
 oxide inclusions for decreased crack sensitivity of sheets in press
 forming)

IT 198487-27-3 198487-29-5 440626-43-7
 440626-44-8 440626-45-9
 RL: TEM (Technical or engineered material use); USES (Uses)
 (microalloyed; austenitic stainless steel with controlled
 oxide inclusions for decreased crack sensitivity of sheets in press
 forming)

L51 ANSWER 3 OF 15 HCA COPYRIGHT 2003 ACS

129:248268 Pitting corrosion behavior of stainless steels in atmospheric environments. Muto, Izumi; Sato, Eiji; Ito, Satoshi; Kihira, Hiroshi (Nippon Steel Corporation, Futtsu, 293, Japan). Plant Aging and Life Prediction of Corrodible Structures, Proceedings of the International Symposium, Sapporo, May 15-18, 1995, Meeting Date 1995, 153-160.
 Editor(s): Shoji, Tetsuo; Shibata, Toshio. NACE International: Houston, Tex. (English) 1997. CODEN: 66PJAG.

AB The pit growth behavior of stainless steels in actual atm. environments was investigated. Pitting of Fe-11Cr and Fe-13Cr proceeded along with uniform corrosion beneath rust layer, while that of Type 430 and 304 stainless steels with higher Cr contents grew directly from the specimen surface. The difference in the pitting forms was estd. from the shape of the Gumbel distribution of pit depth. The max. pit depth, D, increases parabolically with time, t, and is expressed as $\log D = m \log t + c$, where m and c are consts. Among the specimens exposed in the same site, the m value was the same. From the results in various environments, the const. m was dependent on the aggressivity of atm. and increased with increasing concn. of airborne chloride. The relationship between the const. c and the alloying elements was obtained through multi-regression anal. which made it possible to predict the max. pit depth of various grades of stainless steels.

CC 55-10 (Ferrous Metals and Alloys)

IT 11107-04-3, AISI 316 11109-50-5, AISI 304 11109-52-7, AISI 430
 12597-68-1, Stainless steel, processes 12611-79-9, AISI 410
 12725-26-7, AISI 301 39467-88-4, YUS27A 42613-99-0, YUS316C
 59231-56-0, YUS170 69469-05-2, YUS190 188928-65-6, YUS409D
 RL: PEP (Physical, engineering or chemical process); PRP (Properties);
 PROC (Process)

- (pitting corrosion of stainless steels in atm. environments)
IT 39467-88-4, YUS27A
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(pitting corrosion of stainless steels in atm. environments)
- L51 ANSWER 4 OF 15 HCA COPYRIGHT 2003 ACS
128:273390 Antimicrobial **austenitic** stainless steel and process for preparing the same. Taniuchi, Toshihiko; Fujii, Hiroyuki; Takai, Takahiro (Nippon Yakin Kogyo Co., Ltd., Japan; Taniuchi, Toshihiko; Fujii, Hiroyuki; Takai, Takahiro). PCT Int. Appl. WO 9813530 A1 19980402, 38 pp.
DESIGNATED STATES: W: DE, KR, SE, US. (Japanese). CODEN: PIXXD2.
APPLICATION: WO 1997-JP3439 19970926. PRIORITY: JP 1996-256333 19960927; JP 1997-148210 19970605; JP 1997-149265 19970606.
- AB An **austenitic** stainless steel having antimicrobial properties contains C .ltoreq.0.20, Si .ltoreq.2.0, Mn .ltoreq.10, Ni 4.0-28, Cr 12-25, Cu 0.5-5.0, and Al 0.1-5.0% with Nieq. = 12.6(C +N) + 0.35Si + 1.05Mn + Ni + 0.65Cr + 0.6Cu - 0.4Al .gtoreq.20%. An antibacterial layer contg. 1.0-10.0% Cu is formed on the steel surface. The antibacterial layer is preferably a stress-induced transformation layer contg. 3-60% martensite, which is obtained by skin-pass rolling, shotblasting, grinding, rolling, deep drawing, bending, etc. after final annealing, or by **SiO₂** removal after annealing, esp., by passing the steel strip through a salt bath followed by pickling.
- IC ICM C22C038-00
CC 55-6 (Ferrous Metals and Alloys)
ST steel stainless **austenitic** antimicrobial coating
IT Coating materials
(bactericidal; antimicrobial **austenitic** stainless steel and process for prep. the same)
IT Metallurgy
(baths, copper-enriched surface layer formation in; antimicrobial **austenitic** stainless steel and process for prep. the same)
IT Grinding (machining)
Pickling
Rolling (metals)
Shot peening
(copper-enriched surface layer formation by; antimicrobial **austenitic** stainless steel and process for prep. the same)
IT Drawing (forming)
(deep, copper-enriched surface layer formation by; antimicrobial **austenitic** stainless steel and process for prep. the same)
IT Crystallization
(stress-induced; antimicrobial **austenitic** stainless steel and process for prep. the same including)
IT 187668-24-2 187668-27-5 187668-31-1
187668-35-5 187668-39-9 205590-53-0
205590-56-3 205590-58-5
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(antimicrobial **austenitic** stainless steel and process for prep. the same)
IT 7664-39-3, Hydrofluoric acid, processes 7664-93-9, Sulfuric acid, processes 7697-37-2, Nitric acid, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(copper-enriched surface layer formation by pickling with; antimicrobial **austenitic** stainless steel and process for prep. the same)
IT 7440-50-8, Copper, uses

RL: MOA (Modifier or additive use); USES (Uses)
 (copper-enriched surface layer formation; antimicrobial
 austenitic stainless steel and process for prep. the same)

IT 12173-93-2P, Martensite, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (in stress-induced transformation layer; antimicrobial
 austenitic stainless steel and process for prep. the same)

IT 187668-24-2 187668-27-5 187668-35-5
 187668-39-9 205590-53-0 205590-58-5
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
 (Technical or engineered material use); PROC (Process); USES (Uses)
 (antimicrobial austenitic stainless steel and process for
 prep. the same)

L51 ANSWER 5 OF 15 HCA COPYRIGHT 2003 ACS

121:161419 New electrochemical method to evaluate the atmospheric corrosion resistance of stainless steels. Muto, Izumi; Sato, Eiji; Ito, Satoshi (Steel Research Laboratories, Nippon Steel Corporation, Futtsu, 299-12, Japan). ASTM Special Technical Publication, STP 1194(APPLICATION OF ACCELERATED CORROSION TESTS TO SERVICE LIFE PREDICTION OF MATERIALS), 382-93 (English) 1994. CODEN: ASTTA8. ISSN: 0066-0558.

AB The quant. evaluation of atm. corrosion resistance of stainless steels exposed to a marine environment was carried out by using a newly developed electrochem. method. This new method simulates field atm. conditions where most of stainless steels experience rust staining under a thin electrolyte layer. The incubation time to the breakdown of passive film under a thin electrolyte layer corresponds to the rating no. of initial rust staining of the specimen exposed to the actual environment for 1 yr, and depends on alloy compns. Through the anal. of change in the rating no. of the specimens exposed to the marine environment for 10 yr, it was clarified that tendency of the change of rating no. was directly related to exposure time, not to alloy compns. The rating no. of rust staining of stainless steels after several years can be predicted from the equation introduced through the results of both the accelerated test and the exposure test.

CC 55-10 (Ferrous Metals and Alloys)

Section cross-reference(s): 72

IT 11107-04-3, AISI 316 11109-50-5, AISI 304 11109-52-7, AISI 430
 12611-79-9, AISI 410 12725-26-7, AISI 301 39418-83-2
39467-88-4, Yus27A 42613-99-0, YUS 316C 59231-56-0, YUS 170
 64559-78-0 64685-59-2 69469-05-2, YUS 190 157451-78-0
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (corrosion of, in marine atm., accelerated electrochem. test for)

IT **39467-88-4**, Yus27A

RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (corrosion of, in marine atm., accelerated electrochem. test for)

L51 ANSWER 6 OF 15 HCA COPYRIGHT 2003 ACS

120:304410 **Austenitic** stainless steel with high machinability and improved cold workability. Bleton, Olivier; Cholin, Xavier (Ugine Savoie, Fr.). Eur. Pat. Appl. EP 567365 A1 19931027, 9 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE. (French). CODEN: EPXXDW. APPLICATION: EP 1993-400903 19930406. PRIORITY: FR 1992-4810 19920417.

AB The **austenitic** stainless steel contains C <0.1, Si <2, Mn <2, S <0.03, Ni 8-10, Cr 15-25, P .ltoreq.0.04, Mo <0.5, Cu 1-5, N 0.02-0.07 %, Ca >30x10⁻⁴, O >70x10⁻⁴, Al <50x10⁻⁴%, and Ca/O ratio of (0.3-0.6):1. The stainless steel contains malleable oxides having compns. situated in the **Al2O3-SiO2-CaO** phase diagram in a zone of a triple point consisting of anorthite, gehlenite, and

pseudowollastonite. Typically, wear of tools used for machining of the stainless steel for 30 min at a rate of 220 m/min was lower by .apprx.30% than that of conventional AISI 304 stainless steel.

- IC ICM C22C038-42
 ICS C22C038-00
 CC 55-3 (Ferrous Metals and Alloys)
 ST austenitic stainless steel machinability workability
 IT 155327-01-8
 RL: USES (Uses)
 (austenitic, with high machinability and workability)
 IT 1302-54-1, Anorthite 1302-56-3, Gehlenite 14567-52-3,
 Pseudowollastonite
 RL: USES (Uses)
 (inclusions in austenitic stainless steel, for increased
 machinability and workability)
 IT 155327-01-8
 RL: USES (Uses)
 (austenitic, with high machinability and workability)

L51 ANSWER 7 OF 15 HCA COPYRIGHT 2003 ACS

117:255803 Stainless steel with high strength and toughness and their manufacture. Ishijima, Satoshi; Kinoshita, Masayuki; Okita, Tomoyoshi (Nippon Kokan K. K., Japan). Jpn. Kokai Tokkyo Koho JP 04202643 A2 19920723 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-330650 19901130.

AB The steel contains C 0.050-0.150, Si 1.5-3.0, Mn 0.1-2.0, Ni 4.0-8.0, Cr 13.0-17.0, Cr 1.0-3.0, N 0.050-0.150, S 0.0005-0.0050, sol. Al 0.0005-0.0025, O 0.0020-0.0130%, and inevitable impurities which are confined within a tetrahedron of ternary $\text{Al}_2\text{O}_3\text{-MnO-SiO}_2$ phase diagram. The steel is manufd. by soln.-treating at 900-1050.degree. before finishing cold-rolling, adjusting austenitic grains to size No. 8-11.5, cold-rolling to induce 60-95% martensite, and age-hardening at 400-600.degree. for 0.5-5 min. The steel is useful for springs, etc.

- IC ICM C22C038-00
 ICS C21D008-00; C21D009-46; C22C038-42
 CC 55-11 (Ferrous Metals and Alloys)
 IT 144793-94-2P 144794-43-4P 144794-44-5P 144794-45-6P
 144794-46-7P 144794-47-8P
 RL: PEP (Physical, engineering or chemical process); PREP (Preparation);
 PROC (Process)
 (manuf. of high-strength and -toughness)
 IT 144794-45-6P
 RL: PEP (Physical, engineering or chemical process); PREP (Preparation);
 PROC (Process)
 (manuf. of high-strength and -toughness)

L51 ANSWER 8 OF 15 HCA COPYRIGHT 2003 ACS

117:217213 double roll-type casting of iron alloy containing chromium and nickel. Shibata, Koji; Totsuka, Satoru; Maruyama, Tetsuo; Amano, Kagehiro; Toge, Takeya (Nippon Yakin Kogyo Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 04147748 A2 19920521 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-270581 19901011.

AB Molten Fe alloy contg. C .ltoreq.0.20, Si .ltoreq.3.0, Ni .ltoreq.50, Cr 1-50, N .ltoreq.0.3, and optional Cu,Mo 0.01-5 each and Ti 0.01-3% is cast by a double roll-type machine into a thin smooth strip free of fissures and cracks. The Fe alloy melt with Cr/Ni equil. ratio >2.05 is fed to the gap of the double rolls, in horizontal or inclined position, and solidified in part to form on the rolls the shells, which are gradually thickened, drawn downward to give the thin strip, and then

quenched at 50-450.degree./s for a depth of .1toreq.0.2 mm to have residual ferrite of av. .gtoreq.2% in thickness direction. Under roll rotating speed of 20-400 m/min, the cast thin strip is free of cracks.

- IC ICM B22D011-06
 ICS C22C038-00; C22C038-40
 CC 55-2 (Ferrous Metals and Alloys)
 IT 68948-10-7 144387-14-4 144387-15-5 144387-16-6 144413-89-8
 144413-90-1 144413-91-2 **144413-92-3** 144413-93-4
 144413-94-5 144413-95-6 144413-96-7 144413-97-8
 RL: USES (Uses)
 (casing of, double-roll, for crack-free thin strip)
 IT **144413-92-3**
 RL: USES (Uses)
 (casing of, double-roll, for crack-free thin strip)

L51 ANSWER 9 OF 15 HCA COPYRIGHT 2003 ACS

- 116:44731 Cast stainless steel with resistance to corrosion and abrasion. Gajewski, Miroslaw; Hernas, Adam; Tomal, Janusz; Wojcik, Zdzislaw (Politechnika Swietokrzyska, Pol.). Pol. PL 150920 B2 19901031, 2 pp. (Polish). CODEN: POXXA7. APPLICATION: PL 1988-271597 19880331.
 AB The stainless steel contains Cr 14-16, Ni 4-6, and Cu 2.5-3 as well as C .1toreq.0.06, Mn and Si .1toreq.1 each, and P and S .1toreq.0.03% each. The cast parts are suitable for pumps in draining of coal mines and in coal treatment plants, and show high resistance to corrosion and wear for long service life. Thus, the stainless steel contg. C 0.043, Mn 0.44, Si 0.62, Cr 15.4, Ni 4.7, Cu 2.5, P 0.018, and S 0.015% was prep'd. by melting in elec. induction furnace, and was used to manuf. cast parts finished by pptn. hardening, cooling from 1020-1050.degree. in air, and aging for 5 h at 460-480.degree.. The resulting yield strength was 917 MPa, tensile strength 1038 MPa, elongation 18%, impact toughness 65 J/cm², and Brinell hardness 321.

- IC ICM C22C038-42
 CC 55-3 (Ferrous Metals and Alloys)
 Section cross-reference(s): 51
 IT 138388-01-9 **138388-02-0**, Carbon 0-0.1, chromium 14-16, copper 2.5-3, iron 73-80, manganese 0-1, nickel 4-6, silicon 0-1
 RL: USES (Uses)
 (cast, for slurry pump parts)
 IT **138388-02-0**, Carbon 0-0.1, chromium 14-16, copper 2.5-3, iron 73-80, manganese 0-1, nickel 4-6, silicon 0-1
 RL: USES (Uses)
 (cast, for slurry pump parts)

L51 ANSWER 10 OF 15 HCA COPYRIGHT 2003 ACS

- 116:25456 Austenitic stainless steel of good drawability and cold workability. Murata, Wataru; Nakao, Ryuji; Sumitomo, Hidehiko; Takeuchi, Hidemaro (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 03061322 A2 19910318 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1989-194366 19890728.

- AB The steel contains C 0.005-0.1, Si 0.2-1, Mn 0.2-2.5, P .1toreq.0.045, S .1toreq.0.02, Ni 6-20, Cr 15-25, N 0.01-0.1, Al 0.0005-0.005, Ca 0.0001-0.002, Mg 0.0001-0.001, O .1toreq.0.0025, and optionally Mo 0.5-3.5 and/or Cu 0.5-3.5% and its hot-rolled product obtained by heating at 1000-1300.degree. for >10 min before rolling contains oxide inclusions contg. **SiO₂** 20-60, MnO 10-65, **Al₂O₃** .1toreq.15, CaO .1toreq.30, and MgO .1toreq.10%. Thus, bright-annealed 0.5 mm-diam. wire of stainless steel contg. C 0.01, Si 0.57, Mn 1.13, P 0.017, S 0.002, Ni 18.91, Cr 23.53, Mo 0.07, Cu 0.11, Al 0.001, Ca 0.0008, Mg 0.0003, O 0.0015, N 0.0307%, and inclusions contg. **SiO₂** 45.3, MnO 21.3, **Al₂O₃** 6.8, CaO 21.4, and

MgO 9.3% was continuously drawn at 18-20 passes and 8-10% redn. of area to 20 .mu.m. The 1st breakage of wire took place when 46.3 kg wire was drawn, vs. 5.4 kg for similar steel wire contg. 0.0288% O and inclusions with 35.9% Al2O3.

- IC ICM C21D008-06
 ICS C22C038-00; C22C038-40
 CC 55-3 (Ferrous Metals and Alloys)
 ST stainless steel austenite drawability; inclusion compn stainless steel drawability; oxygen control stainless steel drawability
 IT 138010-23-8 138010-24-9 138010-25-0 138010-26-1 138010-27-2
 138010-28-3 138010-29-4 138010-30-7 138010-31-8 138010-32-9
 138010-33-0 138010-34-1 138010-35-2 138010-36-3
 138063-70-4 138063-71-5 138131-52-9
 RL: USES (Uses)
 (oxygen and oxide inclusion control in, for drawability)
 IT 138010-34-1
 RL: USES (Uses)
 (oxygen and oxide inclusion control in, for drawability)

L51 ANSWER 11 OF 15 HCA COPYRIGHT 2003 ACS

114:27857 Stress corrosion characteristics of copper-containing chromium-nickel (18Cr-8Ni) stainless steel in sulfuric acid solution. Asawa, M. (Coll. Educ., Shinshu Univ., Nagano, 380, Japan). Corrosion (Houston, TX, United States), 46(10), 829-36 (English) 1990. CODEN: CORRAK. ISSN: 0010-9312.

- AB Stress corrosion cracking (SCC) tests on 18Cr-8Ni stainless steel with Cu addn. were carried out in H₂SO₄ solns. (with no addns.) under const. loads, where SCC occurred. The SCC susceptibilities, attack morphol., and av., uniform dissoln. rates, were examd. as functions of environmental variables (applied potentials, current densities, H₂SO₄ concns., and test temps.) and stress levels. Analyses of the corrosion product surface layer and measurements of both corroding electrode impedance and polarization curves were also made. SCC occurred at and near corrosion potentials where the uniform dissoln. rates (controlled by the above variables) was $1 \text{ toreq. } 2.5 \text{ nm/s}$. The Cu addn. acted as an anodic and cathodic inhibitor and the surface layer contained metallic Cu or was metallic Cu itself. Preferential crack paths were along (111) plane, deformation bands, and twin boundaries. Some discussion about SCC conditions and a role of Cu in SCC was made.
 CC 55-10 (Ferrous Metals and Alloys)
 Section cross-reference(s): 72
 IT 131197-54-1
 RL: USES (Uses)
 (stress corrosion cracking of, in sulfuric acid, characteristics of)
 IT 131197-54-1
 RL: USES (Uses)
 (stress corrosion cracking of, in sulfuric acid, characteristics of)

L51 ANSWER 12 OF 15 HCA COPYRIGHT 2003 ACS

114:27856 Mechanism of stress corrosion crack initiation of copper-containing chromium-nickel (18Cr-8Ni) stainless steel in sulfuric acid solution. Asawa, M. (Coll. Educ., Shinshu Univ., Nagano, 380, Japan). Corrosion (Houston, TX, United States), 46(10), 823-8 (English) 1990. CODEN: CORRAK. ISSN: 0010-9312.

- AB Crack initiation mechanism of 18Cr-8Ni stainless steel contg. Cu in H₂SO₄ soln. was studied in terms of activation energy for the initiation. The initiation was detected by photo-microscopical observation of specimen surface tested in at 50-90.degree. at stresses of 75-300 MPa. The apparent activation energy was either .apprx.17 or .apprx.86 kJ/mol depending on the stress level and the temp. The initiation stage is a

series of a mech. slip processes of the crystal planes and a dissoln. process of resultant emergent steps.

CC 55-10 (Ferrous Metals and Alloys)

IT 131197-54-1

RL: USES (Uses)

(wire, stress corrosion crack initiation in, mechanism of)

IT 131197-54-1

RL: USES (Uses)

(wire, stress corrosion crack initiation in, mechanism of)

L51 ANSWER 13 OF 15 HCA COPYRIGHT 2003 ACS

107:221384 **Austenitic** stainless steels for tableware. Kinoshita, Noboru; Odagiri, Masatoshi; Azuma, Takeshi (Kawasaki Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 62050442 A2 19870305 Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-190097 19850829.

AB The stainless steels contain C 0.02-0.06, Si 1.0-2.0, Mn 1.0-2.0, Cu 1.0-2.5, Ni 8.0-10.0, Cr 18-20, N .ltoreq.0.030, P .1toreq.0.04, S 0.002-0.010, Al .ltoreq.0.005, and O .ltoreq.0.0050%, optionally with Mo 0.2-1.5% but with no **Al₂O₃** inclusions. The stainless steels show good workability for cold rolling, and good surface finish. Thus, **austenitic** stainless steel as 30-kg ingot contained C 0.023, Si 1.13, Mn 1.21, Cu 1.38, Ni 9.08, Cr 18.16, Mo 0.02, N 0.028, P 0.035, S 0.004, Al 0.004, and O 0.0043%. The ingot was conventionally hot-rolled, cold-rolled, and annealed to give a sheet 3 mm thick. The fine-grained sheet showed initially Vickers hardness 132, and 362 after cold-rolling with 60% draft. A deep-blue scale was formed when heated at 900.degree. in a butane flame, and no defect formation was obsd. when buffered with powd. Cr oxide.

IC ICM C22C038-42

ICS C22C038-44

CC 55-3 (Ferrous Metals and Alloys)

ST tableware stainless steel **austenitic** sheet

IT Eating utensils

(**austenitic** stainless steels for, cold workability and surface finish of)

IT 111487-39-9 111487-40-2 111487-41-3 111487-42-4 111487-43-5

111520-73-1

RL: USES (Uses)

(**austenitic** sheet, cold workability and good surface finish of, for tableware)

IT 111487-43-5

RL: USES (Uses)

(**austenitic** sheet, cold workability and good surface finish of, for tableware)

L51 ANSWER 14 OF 15 HCA COPYRIGHT 2003 ACS

90:90736 Prediction of the nickel equivalence coefficient of copper in steels using Pryce & Andrews and Guiraldenq models. Part II. Mansha, M.; Dilawari, A. H. (Inst. Chem. Eng. Technol., Punjab Univ., Lahore, Pak.). Pakistan Journal of Scientific Research, 30, 75-80 (English) 1978. CODEN: PJSRAV. ISSN: 0552-9050.

AB Stainless steel samples contg. 0-6.2 Cu and 0.8-14.7% Mn were used to det. the Ni-equivalence coeff. of Cu from the structure-vs-compn. diagrams of L. Pryce and K. Andrews (1960) or P. Guiraldenq (1967). No specific value for Cu coeff. could be obtained because of large scatter for individual samples, and of incomplete diagram boundaries.

CC 55-7 (Ferrous Metals and Alloys)

IT 69273-83-2 69273-84-3 69273-85-4 69273-86-5

RL: PRP (Properties)

(structure of, copper coeff. for)

IT **69273-86-5**RL: PRP (Properties)
(structure of, copper coeff. for)

L51 ANSWER 15 OF 15 HCA COPYRIGHT 2003 ACS

84:34375 Warm and cold heading stainless steel. Tevaarwerk, J. L.; Sowerby, R.; Plumtree, A. (Dep. Mech. Eng., Cambridge Univ., Cambridge, UK). Journal of Engineering Materials and Technology, 97(2), 136-43 (English) 1975. CODEN: JEMTA8. ISSN: 0094-4289.

AB Warm- and cold-heading tests ranging from room temp. to 400.degree. were conducted on 305 [12620-36-9] and 3-4% Cu-contg. 302 stainless steel [57686-75-6] wires as well as 1020 steel wire by using a machine that headed 100 blanks/min. Warm-heading of stainless steel wire results in a redn. in the punch load. The 1st and 2nd blows decrease rapidly with increasing temp. up to 200.degree.. Reduced punch loads result in an increase in punch life. For all temps., the heading loads for the Cu-contg. 302 stainless steel were lower than for 305 stainless steel. Both of these materials had a weak dynamic strain-aging effect compared with plain-C steel. At room temp., parts made from both stainless steels had fewer shear cracks when the former material was used. The effects of poly(tetrafluoroethylene) (I) [9002-84-0], graphite, MoS₂ [1317-33-5], and a Cu [7440-50-8] coating as lubricants for wire-drawing were studied. The friction coeffs. for bonded lubricants on 305 stainless steel wire at .ltoreq.400.degree. varied from .apprx.0.029 for bonded I to .apprx.0.095 for bonded MoS₂; graphite gave a value of .apprx. 0.033. Cu alone gave .apprx.0.054, but is not recommended because fine metal particles jam the blanks in the dies. The friction coeff. can also be reduced considerably by use of SAE 30 oil. This is satisfactory for cold-heading only. I-bonded wire seized in the dies at 85.degree., but bonded graphite and MoS₂ were satisfactory up to 200.degree..

CC 55-11 (Ferrous Metals and Alloys)

Section cross-reference(s): 51

IT 12620-36-9 **57686-75-6**

RL: USES (Uses)

(wire, cold- and warm-heading of, effects of lubricants and punch loads and strain aging on)

IT **57686-75-6**

RL: USES (Uses)

(wire, cold- and warm-heading of, effects of lubricants and punch loads and strain aging on)

=> d L52 1-13 cbib abs hitind hitrn

L52 ANSWER 1 OF 13 HCA COPYRIGHT 2003 ACS

137:96785 Development of an activating flux for gas tungsten arc welding of stainless steel. Zhang, Ruihua; Ding, Fan; Yan, Yin; Lei, Jijun (College of Materials Science and Engineering, Gansu Univ. of Tech., Lanzhou, 730050, Peop. Rep. China). Cailiao Kaifa Yu Yingyong, 17(2), 9-12 (Chinese) 2002. CODEN: CKYIF5. ISSN: 1003-1545. Publisher: Cailiao Kaifa Yu Yingyong Bianjibu.

AB An activating flux contg. B2O₃, MnO, Fe₂O₃, Al₂O₃,SiO₂, TiO₂, Cr₂O₃ and NaF for TIG welding of stainless steel was developed. The effects of each component of the flux on the welding penetration was investigated. The primary components of the flux were detd., and the formulas are derived by using an orthogonal test. The welding penetration can be increased by >100% by using the developed flux. Stainless steel plates 8 mm thick was completely penetrated in a single welding pass without a groove. The weld joint was satisfactory in microstructure, chem. compn., mech. properties and corrosion resistance.

CC 55-9 (Ferrous Metals and Alloys)
IT 12597-68-1, Stainless steel, processes 12671-80-6
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(development of an activating flux for gas tungsten arc welding of stainless steel)

IT 12671-80-6
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(development of an activating flux for gas tungsten arc welding of stainless steel)

L52 ANSWER 2 OF 13 HCA COPYRIGHT 2003 ACS
124:295591 Stainless steel sheet manufactured with multistage cold rolling for strength and toughness. Yamauchi, Katsuhisa; Misao, Hitoshi; Inoue, Tadashi; Okita, Tomoyoshi (Nkk Corporation, Japan). U.S. US 5496514 A 19960305, 13 pp., Cont.-in-part of U.S. 5,314,549. (English). CODEN: USXXAM. APPLICATION: US 1994-189902 19940201. PRIORITY: JP 1993-72901 19930308; US 1993-99171 19930729; JP 1993-326172 19931130; JP 1993-326173 19931130.

AB The fracture-resistant stainless steel for sheet manuf. contains C 0.01-0.2, Si 0.1-2, Mn 0.1-2, Cr 13-20, Ni 4-11, N 0.01-0.2, acid-sol. Al 0.0005-0.0025, O 0.002-0.013, Cu 0.08-0.9, and S .ltoreq.0.009%, and has the microstructure with nonmetallic inclusions of **Al2O3-MnO-SiO2** eutectic type. The stainless steel sheet is manufd. with finishing by: annealing, pickling, and 1st-stage cold rolling; 1st intermediate annealing; 2nd-stage cold rolling; 2nd intermediate annealing; 3rd-stage cold rolling; final annealing; 4th-stage cold rolling; and low-temp. heat treatment (esp. for 2-15 s at 400-500.degree.). The resulting sheet shows 1.0% deformation stress .gtoreq.1520 N/mm² with anisotropic difference of .ltoreq.196 N/mm², contains 40-90% martensite, and is suitable for use in tensioned circular saw blades for cutting of Si ingot. The typical stainless steel for circular saw blades contains C 0.10, Si 0.64, Mn 1.02, Cr 16.8, Ni 6.85, N 0.030, acid-sol. Al 0.0008, O 0.0048, Cu 0.28, P 0.030, and S 0.0010%.

IC ICM C22C029-12
ICS C22C038-42; C21D008-02

NCL 420034000

CC 55-11 (Ferrous Metals and Alloys)
IT 12597-68-1, Stainless steel, uses 162247-93-0
162247-94-1 162247-95-2 162247-96-3
162247-98-5 162247-99-6 162248-00-2
162260-45-9 175988-76-8
RL: TEM (Technical or engineered material use); USES (Uses)
(high-strength; stainless steel sheet manufd. with multistage cold rolling for strength and toughness)

IT **162247-93-0 162247-94-1 162247-95-2**
162247-96-3 162247-98-5 162247-99-6
162248-00-2 162260-45-9 175988-76-8
RL: TEM (Technical or engineered material use); USES (Uses)
(high-strength; stainless steel sheet manufd. with multistage cold rolling for strength and toughness)

L52 ANSWER 3 OF 13 HCA COPYRIGHT 2003 ACS
123:175997 Stainless steel thin sheets for inner diameter saw blade supports. Yamauchi, Katsuhisa; Misao, Hitoshi; Inoe, Tadashi; Tachibana, Hiroshi (Nippon Kokan Kk, Japan). Jpn. Kokai Tokkyo Koho JP 07150304 A2 19950613 Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-323111 19931129.

AB The stainless steel sheets contain inclusions at amts. given on an

Al2O3-MnO-SiO2 ternary phase diagram, have an on-set stress .gtoreq.155 kg/mm² at a strain 1.0% with an anisotropy .ltoeq.20 kg/mm², and can sustain a punching work output .gtoreq.25 kg-mm. The stainless steel sheets contain C 0.01-0.20, Si 0.1-2.0, Mn 0.1-2.0, Ni 4.0-11.0, Cr 13.0-20.0, N 0.01-0.20, sol. Al 0.0005-0.0025, O 0.002-0.013, Cu 0.08-0.90, and S .ltoeq.0.0090%, and have a microstructure consisting of 40-90% martensite. The stainless steel sheets are processed by cold rolling 3 times at draft 30-60% with process annealing at 950-1150.degree., finish rolling at draft 60-76%, finish annealing at 950-1150.degree., and aging at 300-600.degree. for 1-30 s.

- IC ICM C22C038-00
 ICS C21D008-02; C21D009-46; C22C038-42
 CC 55-3 (Ferrous Metals and Alloys)
 IT 162260-45-9 164257-99-2 164258-00-8
 164258-01-9 164258-02-0 164258-03-1
 164258-04-2 164258-05-3 164258-06-4
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (stainless steel thin sheets for inner diam. saw blade supports)
 IT 162260-45-9 164257-99-2 164258-00-8
 164258-01-9 164258-02-0 164258-03-1
 164258-04-2 164258-05-3 164258-06-4
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (stainless steel thin sheets for inner diam. saw blade supports)

L52 ANSWER 4 OF 13 HCA COPYRIGHT 2003 ACS

122:245213 Stainless steel sheets for inner diameter saw blade substrates having excellent fracture resistance and their manufacture. Yamauchi, Katsuhisa; Misao, Hitoshi; Inoe, Tadashi; Tachibana, Hiroshi (Nippon Kokan Kk, Japan). Jpn. Kokai Tokkyo Koho JP 06316747 A2 19941115 Heisei, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-268263 19930930. PRIORITY: JP 1993-70729 19930308.

AB The stainless steel sheets contain C 0.01-0.2, Si 0.1-2.0, Mn 0.1-2.0, Ni 4.0-11.0, Cr 13.0-20.2, N 0.01-0.20, sol. Al 0.0005-0.0025, O 0.002-0.013, Cu 0.08-0.09, and S as impurity <0.0090% with inclusions comprising **Al2O3**, **MnO** and **SiO2** in a given compn. and have 40-90% martensite content, 1.0% onset stress .gtoreq.155 kg/mm² and Erichsen value .gtoreq.5.0 mm. The manufg. process comprises annealing and acid pickling of stainless steel strips having the above compn., 1st cold rolling, intermediate annealing, 2nd cold rolling, intermediate annealing, 3rd cold rolling, final annealing, 4th cold rolling, and aging. The draft in the 1st, 2nd, and 3rd cold rolling is 30-60% and that in the 4th cold rolling is 60-76% with draft per pass >3.0-15%. The temp. in the intermediate annealing and final annealing is 950-1150.degree. and the aging is carried out at 300-600.degree. for 1-300 s.

- IC ICM C22C038-00
 ICS C21D008-02; C21D009-46; C22C038-42; C22C038-58
 ICA B28D005-02
 CC 55-11 (Ferrous Metals and Alloys)
 IT 162247-93-0 162247-94-1 162247-95-2
 162247-96-3 162247-97-4 162247-98-5
 162247-99-6 162248-00-2 162260-45-9
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (manuf. of stainless steel sheets contg. controlled amts. of alumina-manganese oxide-silica inclusions for inner diam. saw blade substrates having excellent fracture resistance and manuf.)
 IT 162247-93-0 162247-94-1 162247-95-2
 162247-96-3 162247-97-4 162247-98-5

162247-99-6 162248-00-2 162260-45-9

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (manuf. of stainless steel sheets contg. controlled amts. of alumina-manganese oxide-silica inclusions for inner diam. saw blade substrates having excellent fracture resistance and manuf.)

L52 ANSWER 5 OF 13 HCA COPYRIGHT 2003 ACS

120:276684 Stainless steel thin sheets for inner diameter saw blades (ID blades) for manufacture of silicon wafers, and their manufacture. Misao, Hitoshi; Yamauchi, Katsuhisa; Inoe, Tadashi; Ookita, Tomoyoshi (Nippon Kokan Kk, Japan). Jpn. Kokai Tokkyo Koho JP 06041686 A2 19940215 Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-72901 19930308. PRIORITY: JP 1992-89912 19920313.

AB The stainless steel thin sheets are subjected to a tensile stress .gtoreq.1400 N/mm² in a surface layer 1.0% of sheet thickness thick, and have nonmetallic inclusions consisting of Al₂O₃, MnO, and SiO₂ at amts. detd. by the equil. compns. in an area (given in the patent) of Al₂O₃-MnO-SiO₂ phase diagram. The stainless steel sheets contain C 0.01-0.2, Si 0.1-2.0, Mn 0.1-2.0, Ni 4.0-11.0, Cr 13.0-20.0, N 0.01-0.2, sol. Al 0.0005-0.0025, O 0.0020-0.0100, and S .ltoreq.0.0090%, and have a microstructure contg. 40-90% martensite. The stainless steel sheets may also contain 0.08-0.90% Cu. The stainless steel sheets are manufd. by cold rolling a strip of the steel 3 times at drafts 30-60% with process annealing at 950-1100.degree., finish annealing at 300-600.degree. for 0.1-300 s, and cold rolling at draft 66-76%. The stainless steel sheets show increased strength, and permit to form very thin cutting edges.

IC ICM C22C038-00

ICS C21D008-02; C21D009-46; C22C038-40; C22C038-58; H01L021-78

ICA H01L021-304

CC 55-3 (Ferrous Metals and Alloys)

Section cross-reference(s): 76

IT 154710-60-8 154710-61-9 154710-62-0
 154710-63-1 154710-64-2 154710-65-3
 154710-66-4 154710-67-5 154710-68-6
 154710-69-7

RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (sheets, for manuf. of ID blades)

IT 154710-60-8 154710-61-9 154710-62-0
 154710-63-1 154710-64-2 154710-65-3
 154710-66-4 154710-67-5 154710-68-6
 154710-69-7

RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (sheets, for manuf. of ID blades)

L52 ANSWER 6 OF 13 HCA COPYRIGHT 2003 ACS

113:82680 Collective dislocation effects or phase transitions in the boundaries between nonmetallic inclusions and steel matrix. Gubenko, S. I. (Dnepropetr. Metall. Inst., Dnepropetrovsk, USSR). Fizika Metallov i Metallovedenie (6), 184-8 (Russian) 1990. CODEN: FMMTAK. ISSN: 0015-3230.

AB The inclusion-matrix interfaces generate dislocations, low- or medium-angle boundaries, and twins during high-temp. annealing. This is due to the relaxation of a defective layer on the interphase boundaries, formed during interactions with dislocations during deformation and recrystn. The study was performed on cold-worked (70%) stainless steel 08Kh18N10T and steel E3, annealed at 1000-1200.degree. for 5 min-4 h; the inclusions were Al₂O₃, MnO-Al₂O₃, MnO-Cr₂O₃, and SiO₂.

CC 55-8 (Ferrous Metals and Alloys)
IT 12742-94-8, 08Kh18N10T 12750-62-8, E3
RL: USES (Uses)
(nonmetallic inclusions in, dislocation effects at interphase boundaries of)
IT 12742-94-8, 08Kh18N10T
RL: USES (Uses)
(nonmetallic inclusions in, dislocation effects at interphase boundaries of)

L52 ANSWER 7 OF 13 HCA COPYRIGHT 2003 ACS
112:183521 Nucleation of acicular ferrite on oxygen-rich inclusions.
Ferrante, Maurizio; Akune, Kazuyuki (Univ. Fed. Sao Carlos, Sao Carlos, 13.560, Brazil). Inclusions Their Influence Mater. Behav., Proc. Symp., 193-9. Editor(s): Rungta, Ravi. ASM: Metals Parks, Ohio. (English) 1988. CODEN: 56SJAK.

AB Thermal contraction stresses originate dislocations which surround oxide inclusions. These defects enhance intragranular nucleation of acicular ferrite in weld metals. Calcn. shows that plastic zone around the oxides extends to distances comparable to their radius. These distances are related to the thermal expansion coeffs. of the matrix and the inclusions and increase with their numerical difference. For **Al2O3**.
SiO2.MnO in a ferritic matrix, there is a satisfactory agreement between microstructural observations and theor. calcn. Examm. of 10 weld metal samples shows a pos. correlation between the proportion of acicular ferrite and size of the plastic zone.

CC 55-8 (Ferrous Metals and Alloys)
IT 54791-48-9, API 5L X65, uses and miscellaneous 125169-23-5, Chromium 24, iron 71, nickel 5
RL: USES (Uses)
(weld deposit of, inclusions in, thermal stress at, acicular ferrite pptn. from)
IT 125169-23-5, Chromium 24, iron 71, nickel 5
RL: USES (Uses)
(weld deposit of, inclusions in, thermal stress at, acicular ferrite pptn. from)

L52 ANSWER 8 OF 13 HCA COPYRIGHT 2003 ACS
105:10350 Pressure brazing of ceramics to metals with a copper braze.
Pavlova, M. A.; Metelkin, I. I. (USSR). Svarochnoe Proizvodstvo (4), 8-10 (Russian) 1986. CODEN: SVAPAI. ISSN: 0491-6441.

AB Dielec. ceramic VK94-1 (94% **Al2O3** + **SiO2**, **MnO**, etc.) is brazed with Cu under pressure to metals and alloys to give vacuum-tight joints that resist thermal coupling and tropical humidity. Ceramics with apprx. 100% **Al2O3** (A-995 and sapphire) also are well bonded, but with only 50-60% of the strength of VK94-1. The ceramics were bonded to Kovar 29NK [12666-48-7], Armco Fe, Ni, stainless steel 12Kh18N10T, Mo, Mo-Cu-Ni alloy MD15NP [65546-54-5], and Mo-Cu alloy MD40 [78408-66-9]. Metal and alloy solv. in Cu limited the time exposure for best joining, e.g. Ni short time, and insol. Mo long time.

CC 56-9 (Nonferrous Metals and Alloys)
Section cross-reference(s): 55, 57, 76
IT 12666-48-7 50947-31-4 65546-54-5 78408-66-9 7439-98-7, uses and miscellaneous 7440-02-0, uses and miscellaneous
RL: PROC (Process)
(brazing of, with copper under pressure to alumina ceramics)
IT 50947-31-4
RL: PROC (Process)
(brazing of, with copper under pressure to alumina ceramics)

- L52 ANSWER 9 OF 13 HCA COPYRIGHT 2003 ACS
 102:170407 Thermodynamic analysis of formation of oxide scabs on steel
 12Kh18N9TL castings. Laptev, V. G.; Urazbaev, B. K. (USSR). Liteinoe
 Proizvodstvo (10), 3-4 (Russian) 1984. CODEN: LIPRAX. ISSN: 0024-449X.
- AB An oxide scab formed on 12Kh18N9TL [12611-78-8] steel castings
 was analyzed. The scab consisted of SiO_2 , TiO_2 , Al_2O_3
 MnO , and Cr_2O_3 in a decreasing order. No Fe_2O_3 was found.
 Thermodn. reactions occurring during steel deoxidn. and casting were
 considered in the system consisting of the metal, scab, surrounding atm.
 and sand mold. To suppress scab formation, it was recommended to increase
 pouring temp. above the scab-forming threshold temp., increase pouring
 rate, cast in an inert atm. or vacuum, complete deoxidn. before pouring to
 prevent deoxidn. by Ti contained in the steel, and maintain Ti and Mn
 contents at their lower and upper limits, resp.
- CC 55-2 (Ferrous Metals and Alloys)
- IT 12611-78-8
 RL: USES (Uses)
 (oxide scab formation on cast, thermodn. of)
- IT 12611-78-8
 RL: USES (Uses)
 (oxide scab formation on cast, thermodn. of)
- L52 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS
 100:213802 Reliability of joints in bimetal layers produced by rolling.
 Surovtsev, A. P.; Yarovoi, V. V.; Khangulov, V. V.; Yudina, N. S. (USSR).
 Term. Obrab. Metalloved. Kach. Stalei Splavov, 19-24. Editor(s):
 Golovanenko, S. A. Metallurgiya: Moscow, USSR. (Russian) 1983. CODEN:
 51GIAO.
- AB Reliability of corrosion-resistant bimetal joints, relating to low values
 of joint impact toughness, was studied. Tests were carried out on
 bimetals, such as 09G2S (base layer) [37195-20-3]-08Kh17N13M2T (clad
 layer) [59093-32-2], 09G2S-08Kh18N10T [12742-94-8], 09G2S-St3
 [39296-41-8]-08Kh18N10T, etc., obtained by diffusion welding during
 rolling. Low values of joint impact toughness were related to the
 presence of oxide inclusions of MnO . SiO_2 . Al_2O_3
 (TiO_2) -type, at high amts., and esp. due to formation of oxide films of
 FeO . Cr_2O_3 or Fe_3O_4 -type. The impact toughness was improved by high-temp.
 annealing of bimetals, assuring partial dissoln. of Ni interlayer and its
 satn. with alloying elements.
- CC 55-9 (Ferrous Metals and Alloys)
- IT 12742-94-8 37195-20-3, uses and miscellaneous 39296-41-8, uses
 and miscellaneous 59093-32-2
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (diffusion welding of, for corrosion-resistant bimetals, impact
 toughness in, rolling in relation to)
- IT 12742-94-8
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (diffusion welding of, for corrosion-resistant bimetals, impact
 toughness in, rolling in relation to)
- L52 ANSWER 11 OF 13 HCA COPYRIGHT 2003 ACS
 99:92635 Study of crystallization and the dilatometric properties of glasses
 and glass ceramic materials of the R2O-manganese monoxide-aluminum
 oxide-silicon dioxide-titanium dioxide system. Grechanova, S. B.;
 Rukasevich, L. D.; Ramazanova, A. N. (Novocherk. Politekh. Inst.,
 Novocherkassk, USSR). Izvestiya Severo-Kavkazskogo Nauchnogo Tsentra
 Vysshhei Shkoly, Tekhnicheskie Nauki (1), 92-4 (Russian) 1983. CODEN:
 ISSND8. ISSN: 0321-2653.
- AB The properties of R2O- MnO - Al_2O_3 - SiO_2 - TiO_2
 glasses and glass-ceramics were studied with respect to the development of

heat-resistant coatings with high thermal expansion coeff. (.alpha.) for KhN78T [12665-30-4] and Kh18N9T [12611-78-8] alloys. The crystallizability and thermal expansion of the glasses and glass-ceramics depended on the K2O/Na2O ratio and were optimum for the ratio equal to 1. The partial substitution of Al2O3 by SiO2 and MgO and increase in MnO content resulted in the formation of glass-ceramics with .alpha. = 132.4 times. 10-1/degree and contg. cristobalite and pyrophanite as the main cryst. phases.

CC 57-4 (Ceramics)

IT **12611-78-8** 12665-30-4

RL: USES (Uses)

(enamels for, glass and glass-ceramic, with high thermal expansion coeff.)

IT **12611-78-8**

RL: USES (Uses)

(enamels for, glass and glass-ceramic, with high thermal expansion coeff.)

L52 ANSWER 12 OF 13 HCA COPYRIGHT 2003 ACS

91:161214 Wettability of solid oxide and sulfide phases by iron and stainless steel melts. Staronka, Andrzej; Golas, Wojciech (Foundry Inst., Acad. Min. Metall., Krakow, Pol.). Archiv fuer das Eisenhuettenwesen, 50(6), 237-42 (German) 1979. CODEN: AREIAT. ISSN: 0003-8962.

AB Wettability of CaO, MgO, **Al2O3**, **SiO2**, **MnO**, ZrO₂, and CaS by molten Fe and stainless steels X15CrNiSi25202 [37268-89-6] and X6CrNiMn 1748 [71497-78-4] was studied. The max. bubble pressure and sessile drop methods were used to measure surface tension and interfacial energies. The values obtained by the max. bubble pressure method were somewhat lower than those obtained by the other method when the S. Sugden correction (1922) was used. Without the correction, the values of the max. bubble pressure method were higher. Differences in surface tension of X6CrNiMn 1748 before and after refining with Ar for the max. bubble pressure and sessile drop methods were .apprx.40 and .apprx.100 mN/m, resp. The max. bubble pressure method was considered more precise and more reliable. According to the data for free energy of immersion to the surface and work of adhesion of metals to substrate, Al2O3, MgO, CaO, and ZrO₂ had a high tendency and MnO, SiO₂, and CaS had a low tendency to melt rejection.

CC 55-8 (Ferrous Metals and Alloys)

IT 37268-89-6 **71497-78-4**

RL: USES (Uses)

(wettability of solid oxides and sulfides by molten)

IT **71497-78-4**

RL: USES (Uses)

(wettability of solid oxides and sulfides by molten)

L52 ANSWER 13 OF 13 HCA COPYRIGHT 2003 ACS

84:183055 Properties of nonmetallic inclusions in steels. Shiraiwa, Toshio; Fujino, Nobukatsu; Matsuno, Fumio (Cent. Res. Lab., Sumitomo Met. Ind. Ltd., Japan). Sumitomo Search, 11, 85-100 (English) 1975. CODEN: SUSEAY. ISSN: 0585-9131.

AB The crystn. of glassy silicate and oxide inclusions during heat treatment and their phys. properties before and after crystn. were investigated. Crystn. of the inclusions in rimmed steel [12597-69-2], Si-killed steel, stainless steel 18-8 [12671-80-6], and Ca-deoxidized free-cutting steels was investigated by using actual inclusions and synthetic inclusions of the **MnO-Al2O3-SiO2** and **MnO-(AlCr)2O3-SiO2** systems. Ppts. were identified and isothermal crystn. diagrams of inclusions were detd. Compn. ranges of stable glassy silicates were detd. for the **MnO-Al2O3-**

SiO₂ and **CaO-MnO-Al₂O₃-SiO₂** systems.

Vickers hardnesses of the synthetic inclusions at elevated temps. and softening temps. were detd. Deformation behavior during hot-rolling of the steels was investigated by using inclusions of the **MnO-Al₂O₃-SiO₂** system. Glassy inclusions showed good elongation, but fully crystd. inclusions did not deform. Galaxite [1302-69-8] and manganesewustite were found in rimmed and Si-killed steels, cristobalite [14464-46-1] in the latter and in the synthetic oxide inclusions. Tephroite [14987-02-1], spessartite [12252-51-6], galaxite, cristobalite, and corundum [1302-74-5] pptd. in the glassy oxides and cristobalite, wollastonite [13983-17-0], anorthite [1302-54-1], gehlenite [1302-56-3], and Ca aluminates in other synthetic glassy inclusions.

CC 55-7 (Ferrous Metals and Alloys)

IT **12671-80-6**

RL: USES (Uses)
(inclusion crystn. in)

IT **12671-80-6**

RL: USES (Uses)
(inclusion crystn. in)